DOCUMENT RESUME

ED 205 335 RC 012 848

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TITLE Small Schools Mathematics Curriculum, K-3: Reading, Language Arts, Mathematics, Science, Social Studies. Scope, Objectives, Activities, Resources, Monitoring Procedures.
INSTITUTION Educational Service District 189, Mt. Vernon, Wash.; Washington Office of the State Superintendent of Public Instruction, Olympia.
SPONS AGENCY Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE Nov 78
NOTE 736p.; For related documents, see RC 012 825-847 and RC 012 849-851.

EDRS PRICE MF04/PC30 Plus Postage.
DESCRIPTORS *Behavioral Objectives; Educational Objectives; *Elementary School Mathematics; Evaluation Methods; Geometry; *Instructional Materials; Learning Activities; *Mathematical Enrichment; *Mathematics Curriculum; Mathematics Materials; Measurement; Minimum Competencies; Perception; Primary Education; *Small Schools; State Curriculum Guides; Student Evaluation; Whole Numbers
IDENTIFIERS Washington

ABSTRACT

Developed during 1975-76 by 40 primary teachers and 10 elementary principals from 12 small school districts in 2 Washington counties and first used during 1976-77 in more than 20 districts, this K-3 mathematics curriculum is designed to assist district compliance with Washington's Student Learning Objectives (SLO) Law, which requires identification of student learning objectives and evaluation of each student's performance related to the attainment of the objectives. Specific learning objectives for mathematics, suggested activities, monitoring procedures and possible resources used in teaching to the objectives are presented, following the unique Small Schools Curriculum format. Mathematics goals for the entire K-12 curriculum and areas of study for K-8 are outlined. Included in the scope of the K-3 curriculum are counting (serial, objects, order), equality and inequality, reading and writing numerals, place value, addition, subtraction, multiplication, division, story problems, common fractions, geometric shapes (square, circle, triangle, rectangle), simple graphs and measurements (time, money, linear, volume, weight, temperature). (NEC)

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ED205335

November 1978

SMALL SCHOOLS

MATHEMATICS CURRICULUM

K-3

Reading • Language Arts • Mathematics • Science • Social Studies

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Dr. Frank B. Brouillet, State Superintendent of Public Instruction, Olympia, Washington

SMALL SCHOOLS

MATHEMATICS CURRICULUM

K-3

Scope

Objectives

Activities

Resources

Monitoring Procedures

November 1978

This is a publication of the Instructional Programs Division
of the Superintendent of Public Instruction, Olympia, Washington.

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4

ACKNOWLEDGMENTS

The Small Schools Student Curriculum Materials were written by a consortium of teachers and administrators from local districts, Educational Service District 189 and the office of Superintendent of Public Instruction.

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APPRECIATION

Many educators have been involved in the development of the Small Schools Curriculum materials. Of these, Robert Groeschell, now retired from the office of the State Superintendent of Public Instruction, deserves special recognition for his insight, leadership and support in initiating the Small Schools Curriculum Project.

In order to provide assistance to small school districts, a curriculum assessment was conducted by Mr. Groeschell in the spring of 1975. The findings of this assessment pointed out the need for the development of curriculum guidelines to assist small districts in identifying learning objectives and in planning for program implementation. These findings were used to provide the basis for originally funding the Small Schools Curriculum Project.

◆◆◆

Appreciation is extended to Dr. Charles Murray, Superintendent, and the staff of ESD 189 for providing meeting space, equipment and resources which facilitated the development of the Small Schools Curriculum materials.

Additional appreciation is given to the pilot districts and ESDs 171 and 189 for their assistance in field testing and revising the primary Small Schools Curriculum materials.

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6

TABLE OF CONTENTS

Introduction...vi

Organization of Small Schools Materials.............................vi

Relationship to SLO Law..vii

Format..viii

Definition of Format Terms...x

Goals for the Washington Common Schools............................xii

Mathematics Program Goals...xiii

Mathematics Scope (K-8)...xv

Mathematics Objectives, Activities, Monitoring Procedures
and Resources..........................(See Mathematics Scope)..xv

INTRODUCTION

The Small Schools materials were developed through the cooperative efforts of three levels of educational organizations: local, regional, and state. Forty primary teachers and ten elementary principals from small districts in Snohomish and Island Counties (Arlington, Darrington, Granite Falls, Lake Stevens, Lakewood, Monroe, Snohomish, Stanwood, Sultan, South Whidbey and Monroe Christian School), developed and sequenced student learning objectives for grades kindergarten through third in five curriculum areas: reading, language arts, mathematics, science and social studies. Suggested activities, monitoring procedures and possible resources used in teaching the objectives were identified and each student learning objective was correlated to the State Goals for Washington Common Schools and to broad program goals.

On the following pages you will find the Small Schools Mathematics Curriculum Materials for grades kindergarten through third. Included are student learning objectives, suggested activities, suggested monitoring procedures and possible resources. These materials were developed during 1975-76, and were piloted during the 1976-77 school year in more than twenty small districts within the state. Pilot districts included the districts which originally developed the materials, as well as Methow Valley, Chelan, Entiat, Orondo, Leavenworth, Peshastin-Dryden, Washtucna, Wahluke, Royal City, Wilson Creek, Othello and Quincy. Personnel from ESDs 189 and 171 assisted with the implementation of the pilot materials by providing regional organization, coordination, technical assistance and secretarial services. Data collected from the pilot districts were used to modify the materials in preparation for publication and statewide distribution.

Original funding for the project was made available through a Title IV, Part C grant awarded to the Lake Stevens School District. Technical assistance in the development of the winning proposal was provided by ESD 189 and SPI. Since November, 1975, funds for the project have been been available through the budget of the Superintendent of Public Instruction, Division of Curriculum and Instruction. ESD 189 and the office of the Superintendent of Public Instruction have worked cooperatively to provide participating districts with curriculum assistance, organization leadership, editorial services and the publication of materials. Curriculum Specialists from Washington colleges, universities, and local school districts also assisted with the development of materials.

ORGANIZATION OF THE SMALL SCHOOLS MATERIALS

Book covers and objective pages for all Small Schools materials have been color-coded for each subject: Reading--green, Language Arts--yellow, Mathematics--blue, Social Studies--buff, and Science--pink. Following each colored objective page there are several pages which identify activities, resources and monitoring procedures which may be used when teaching to the objectives. See page viii of this book for a more detailed explanation of the format. On that objective page all objectives for an area of the scope are identified. Within each curriculum book the objectives have been correlated to the goals for the Washington Common Schools and to the Small Schools Program Goals for that subject area.

Accompanying the Small Schools curriculum books are resource assessment booklets for reading, language arts and mathematics, grades K-3. Within each assessment booklet test items are provided for a selected number of Small Schools objectives. The suggested test items may be used directly by teachers to assess student performance, or they may serve as models for other test items to be developed by the classroom teacher.

Another booklet containing only the Small Schools objectives is available. This booklet contains objectives for reading, language arts and mathematics, grades K-8, and for science and social studies, grades K-3. Also within this booklet are the program goals and the scope for each curriculum area.

RELATIONSHIP TO THE SLO LAW

The purpose of this book and all other Small Schools materials is to assist teachers with the improvement of curriculum and instruction. In addition, it is expected that many smaller districts lacking curriculum personnel will find this book helpful in complying with the SLO law. (This law requires districts to identify student learning objectives and to evaluate each student's performance related to the attainment of the objectives.) Contained within this book are many more objectives than any district would choose to identify as their SLO objectives. In order to provide districts with assistance in identifying objectives which might compose their SLO list, selected objectives are marked with an asterisk (*). These objectives have been selected with the understanding that they serve only as a model when using the Small Schools materials in helping district personnel meet the requirements of the SLO Law.

For more information concerning the SLO Law, see the Handbook for School District Implementation of the Student Learning Objectives Law available from the office of the State Superintendent of Public Instruction.

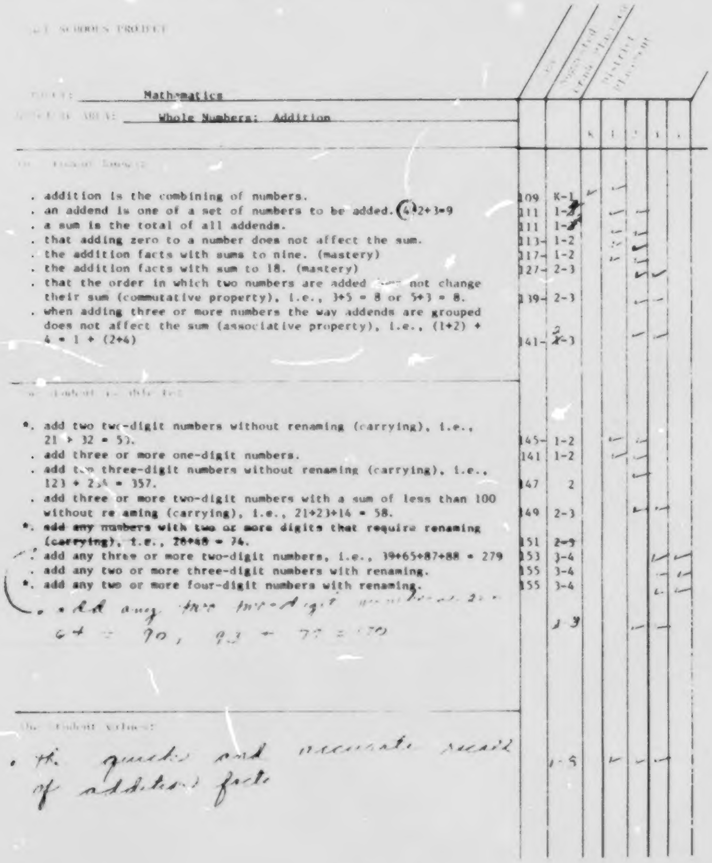
FORMAT

One unique feature of the Small Schools Curriculum is the format or arrangement of information on the page. The format was developed in order to facilitate the transportability of the product by allowing districts to personalize the curriculum materials to meet their own educational programs. The Small Schools Format provides a simple arrangement for listing objectives and identifying activities, monitoring procedures, and resources used in teaching.

Page One

The first format page lists the sequence of student learning objectives related to a specific area of the curriculum for either reading, language arts, mathematics, science or social studies. For each objective a grade placement has been recommended indicating where each objective should be taught and mastered. The grade recommendation is made with the understanding that it applies to most students and that there will always be some students who require either a longer or shorter time than recommended to master the knowledges, skills and values indicated by the objectives.

Columns at the right of the page have been provided so district personnel can indicate the grade placement of objectives to coincide with the curriculum materials available in their schools. District personnel may also choose to delete an objective by striking it from the list or add another objective by writing it directly on the sequenced objective page.



Mathematics

Whole Numbers: Addition

. addition is the combining of numbers.	109	K-1
. an addend is one of a set of numbers to be added. (4) 2+3=9	111	1-2
. a sum is the total of all addends.	111	1-2
. that adding zero to a number does not affect the sum.	113	1-2
. the addition facts with sums to nine. (mastery)	117	1-2
. the addition facts with sum to 18. (mastery)	127	2-3
. that the order in which two numbers are added does not change their sum (commutative property), i.e., 3+5 = 8 or 5+3 = 8.	139	2-3
. when adding three or more numbers the way addends are grouped does not affect the sum (associative property), i.e., (1+2) + 4 = 1 + (2+4)	141	2-3
*. add two two-digit numbers without renaming (carrying), i.e., 21 + 32 = 53.	145	1-2
. add three or more one-digit numbers.	141	1-2
. add two three-digit numbers without renaming (carrying), i.e., 123 + 234 = 357.	147	2
. add three or more two-digit numbers with a sum of less than 100 without renaming (carrying), i.e., 21+23+14 = 58.	149	2-3
*. ~~add any numbers with two or more digits that require renaming (carrying), i.e., 26+48 = 74.~~	151	~~2-3~~
. add any three or more two-digit numbers, i.e., 39+65+87+88 = 279	153	3-4
. add any two or more three-digit numbers with renaming.	155	3-4
*. add any two or more four-digit numbers with renaming.	155	3-4
. add any two two-digit [illegible] 64 + [illegible] 90, 93 + 77 = 170		2-3
. the quick and accurate recall of addition facts		1-5

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Page Two

On the second format page, one or more objectives from the first format page are rewritten and suggested activities, monitoring procedures and possible resources used in teaching to the objective(s) are identified. The objectives are correlated to the State Goals for Washington Common Schools and to broad K-12 program goals. The suggested grade placement of the objectives and the activities is indicated and, wherever applicable, the relatedness of an objective to other curriculum areas have been shown. Particular effort has been given to correlating the materials with the areas of Environmental Education, and the use of the newspaper in the classroom.

Below is an example of a completed second format page. Teachers and principals in local districts may personalize this page by listing their own resources and by correlating their district goals to the student learning objectives.

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows the addition facts with sums to nine (mastery).

State Goal 1,7,10

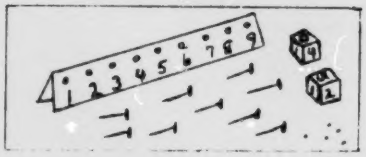
District Goal

Program Goal

Related Area(s)

ggested Activities: Grade(s) 1

Title: Nine Holes
Group Size: pairs of students
Materials: 2 tagboard strips with 9 holes,
2 cubes, one cube marked with numbers 0-5 and another cube marked with numbers 0-4 plus an extra 0.
9 golf tees for each student (18 total)



Procedure:

. Teacher directs as follows:
- (a) First player rolls the dice.
- (b) Player adds the addends and says the equation aloud (e.g., "Zero plus five equals five.").
- (c) Player then puts a golf tee in the hole representing that sum (5).
- (d) The next player takes a turn, following the same procedure.
- (e) The first player to fill all 9 holes with golf tees wins the game.
- (f) When there are only 2 or 3 holes left to

Suggested Monitoring Procedures

Student often uses manipulative aids or other aids.

Mastery of addition facts with sums to nine implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 6+3?" or if shown $\boxed{\begin{array}{r}6\\+3\end{array}}$ or $\boxed{6+3}$ in written form, the student responds instantly from memory. Check one student at a time.

Possible Resources

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 91-93

District Resources

DEFINITION OF FORMAT TERMS
Small Schools Curriculum Project

Subject indicates a broad course of study. The subject classifies the learning into one of the general areas of the curriculum, i.e., reading, mathematics, social studies.

Specific Area indicates a particular learning category contained within the subject. Within the subject of reading there exist several specific areas, i.e., comprehension, study skills, word attack skills.

State Goal indicates a broad term policy statement relating to the education of all students within the State of Washington. In 1972, the State Board of Education adopted 10 State Goals for the Washington Common Schools.

District Goal generally reflects the expectations of the community regarding the kinds of learning that should result from school experience. These goals are employed mainly to inform the citizenry of the broad aims of the school. When district goals are correlated to student learning objectives, community members are able to see how their expectations for schools are translated daily into the teaching/learning process of the classroom.

Program Goals are K-12 goals which do not specify grade placement. These goals provide the basis for generating subgoals or objectives for courses or units of study within a subject area. Program goals are used as a basis for defining the outcomes of an entire area of instruction such as mathematics, language arts or social studies.

Student Learning Objectives

Three major types of learning objectives which have been identified are knowledge, process and value objectives.

> Knowledge Student Learning Objectives identify something that is to be known and begins with the words, "The student knows...". Knowledge objectives specify the knowledge a student is expected to learn. These objectives include categories of learning such as specific facts, principles and laws, simple generalizations, similarities and differences, etc.
>
> An example of a Knowledge Student Learning Objective is: "The student knows guide words in a dictionary indicate the first and last words on the page."
>
> Process Student Learning Objectives identify something the student is able to do, and begins with the words, "The student is able to...". These objectives are associated with the rational thinking processes of communication, inquiry, problem solving, production, service and human relationships.
>
> An example of a Process Student Learning Objective is: "The student is able to associate a consonant sound with the letter name."

Value Student Learning Objectives identify only the type of values which foster the context of the discipline. These objectives are thought to be most uniformly and consistently approved by society as supporting the major aims of the discipline.

An example of a Value Student Learning Objective is: The student values the role of plants in his/her daily life."

Suggested Learning Activities describe the behavior of both the teacher and students. The instructional strategies employed by the teacher, as well as the activities undertaken by the students, are included in this section. Each activity includes materials, group size and procedures.

Suggested Monitoring Procedures indicate informal methods for determining the progress a student is making towards the attainment of the objective. These methods include techniques such as teacher observation, student interest and attitude surveys and recording results of classroom instruction.

Possible Learning Resources indicate materials, teacher-made or commercially produced, which are needed by both the teacher and students in order to accomplish the learning activities.

GOALS FOR THE WASHINGTON COMMON SCHOOLS

1. As a result of the process of education, all students should have the basic skills and knowledge necessary to seek information, to present ideas, to listen to and interact with others, and to use judgment and imagination in perceiving and resolving problems.

2. As a result of the process of education, all students should understand the elements of their physical and emotional well-being.

3. As a result of the process of education, all students should know the basic principles of the American democratic heritage.

4. As a result of the process of education, all students should appreciate the wonders of the natural world, human achievements and failures, dreams and capabilities.

5. As a result of the process of education, all students should clarify their basic values and develop a commitment to act upon these values within the framework of their rights and responsibilities as participants in the democratic process.

6. As a result of the process of education, all students should interact with people of different cultures, races, generations, and life styles with significant rapport.

7. As a result of the process of education, all students should participate in social, political, economic, and family activities with the confidence that their actions make a difference.

8. As a result of the process of education, all students should be prepared for their next career steps.

9. As a result of the process of education, all students should use leisure time in positive and satisfying ways.

10. As a result of the process of education, all students should be committed to life-long learning and personal growth.

MATHEMATICS PROGRAM GOALS
(K-12)

1. The student values the study of mathematics for its usefulness and application to everyday life.
2. The student develops the ability to communicate with precision and confidence using the vocabulary and symbols unique to mathematics.
3. The student develops the concept of number and numeration including counting, place value, reading and writing numbers, various numbering systems, number theory and scientific notation.
4. The student develops general mathematical concepts of time-space relationships; equality-inequality; measurement; function; graphs, charts and tables; probability and statistics; and geometry.
5. The student develops accuracy in using the computational skills of adding, subtracting, multiplying and dividing.
6. The student develops the ability to use problem-solving techniques.
7. The student develops the knowledge and use of the structure of mathematical systems and real numbers.
8. The student knows and is able to use the symbols, elements, operations and structure of the following number systems: whole numbers, integers, rational numbers, real numbers and complex numbers.

MATHEMATICS
SCOPE (K-8)

I. WHOLE NUMBERS
  - A. Counting (Serial, Objects, Order) -- K-3) ... 1
  - B. Equality and Inequality -- K-6 ... 37
  - C. Reading and Writing Numerals -- K-6 ... 53
  - D. Place Value -- K-6 ... 93
  - E. Addition -- K-8 ... 107
  - F. Subtraction -- 1-8 ... 157
  - G. Multiplication -- 3-8 ... 181
  - H. Division -- 3-8 ... 197
  - I. Story Problems -- 2-8 ... 209

II. INTEGERS -- 7-8 ...

III. RATIONAL NUMBERS
  - A. Common Fractions -- K-8 ... 229
  - B. Ratios, Percentage, Proportion -- 6-8 ...
  - C. Decimals -- 6-8 ...

IV. REAL NUMBERS -- 7-8 ...

V. ALGEBRAIC EXPRESSION -- 7-8 ...

VI. NUMERATION
  - A. Number Theory -- 4-8 ...
  - B. Scientific Notations, Exponents -- 6-8 ...

VII. GEOMETRY
  - A. K-3 ... 253
  - B. Shapes - Two, Three Dimensional -- 4-8 ...
  - C. Points, Lines, Line Segments -- 4-8 ...
  - D. Angles, Triangles -- 5-8 ...
  - E. Circles -- 4-8 ...
  - F. Perimeter -- 4-8 ...
  - G. Area -- 6-8 ...
  - H. Volume -- 7-8 ...

VIII. GRAPHS -- K-8 ... 271

IX. PROBABILITY AND STATISTICS -- 4-8 ...

X. MEASUREMENTS
  - A. Time -- K-8 ... 285
  - B. Money -- 1-8 ... 313
  - C. Linear -- K-8 ... 327
  - D. Capacity (Volume) -- 1-8 ... 357
  - E. Weight -- 2-8 ... 365
  - F. Temperature -- 3-8 ...
  - G. Maintenance of English Measurement -- 4-8 ...

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SMALL SCHOOLS PROJECT

SUBJECT: **Mathematics**

SPECIFIC AREA: **Whole Numbers: Counting (Serial, Objects), Order**

	Page	Suggested Grade Placement	District Placement K	District Placement 1	District Placement 2	District Placement 3	District Placement 4
The student knows:							
The student is able to:							
. count to 10.	3-	K					
. count to 100.	7	1-2					
*. count objects to 10.	9-	K					
*. count objects to 50.	11-	1					
. count objects by 2's to 100.	15-	1-2					
. count objects by 5's to 100.	19-	1-2					
*. count objects by 10's to 100.	23-	1-2					
. identify the position of objects first through tenth.	25-	K-1					
. name the number before, after or between any number to 10.	29	K-1					
*. name the number before, after or between any number to 100.	31-	1-2					
. name the number before, after or between any number to 1,000.	35-	2-3					
The student values:							

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ________________

SMALL SCHOOLS PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to count to 10.

Related Area(s)

State Goal	1,[illegible],8
District Goal	
Program Goal	1,2,5

Suggested Activities: Grade(s) K

Title: I Spy
Group Size: small group
Materials: any small object

Procedure:

- Teacher selects a student to be "it" (or other students may select a classmate).
- Selected student hides an object while the rest of the students close their eyes and count to 10.
- Students then open their eyes and search for the hidden object.
- The player who finds the object becomes the one who hides the object next.

Title: Circle Counting
Group Size: groups of 10 or less
Materials: none

Procedure:

- Ten or less students stand in each circle.
- One student is assigned to be the counting starter.
- The starter tells the groups to "begin counting". Each student counts in order and the one who says the last number in the circle sits on the floor. The next student begins once more; the last sits down.
- Activity continues until one student remains standing.

Suggested Monitoring Procedures

Mini-Test: "Counting to 10"
Group Size: one student
Procedure:

- Teacher asks student to count from 1 to 10.

Possible Resources

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 98-99, 112-113

District Resources

Suggested Activities: Grade(s) K

Suggested Monitoring Procedures

Possible Resources

Title: Bounce Counting
Group Size: whole class or small group
Materials: ball

Procedure:

- One student bounces a ball while the students count: "one, two. . . ten."

Title: The Striking Clock
Group Size: entire class
Materials: a rhythm instrument, triangle and striker or a bell

Procedure:

- Students stand in a circle with feet spread and rock from side to side as they say the poem below.
  Poem: "We are swinging pendulums
  Hanging from a clock.
  As we count the hours struck,
  We rock and tick and tock."
- One student stands in the center of the circle with a triangle to strike the hour when the poem has been said.
- The students count as each hour is struck.

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 96-97

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 197 6, pp. 96-97

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to count to 10.

State Goal	1,7,8
District Goal	
Program Goal	1,2,5

Related Area(s)

Suggested Activities: Grade(s) K

Title: Poems and Fingerplays
Group Size: entire class
Materials: poems

Procedure:

- Teacher reads poem and demonstrates action. Students then recite and follow the action as indicated.

TEN FINGERS

I have ten little fingers
And they all belong to me.
I can make them do things.
Would you like to see?
I can shut them up tight
Or open them wide.
I can put them together
Or make them all hide.
I can make them jump high,
I can make them jump low,
I can fold them quietly
And hold them just so.

Suggested Monitoring Procedures

Possible Resources

Sharp, F. A., *These Kids Don't Count*, Academic Therapy Publications, 1971, pp. 13-14

Grayson, Marion F., *Let's Do Finger Plays*, Luce, 1962

Ginsberg, Herbert, *Children's Arithmetic*: The Learning Process, D. Van Nostrand Co., 1977, chapter 1

D'Augustine, Charles, *Multiple Methods of Teaching Mathematics in the Elementary School*, Harper and Row, 1973, p. 64

District Resources

Suggested Activities: Grade(s) K

Suggested Monitoring Procedures

Possible Resources

FIVE LITTLE FROGGIES

Five little froggies sat on the shore,
(open hand; extend fingers. Push down one finger at each frog leaves.)
One went for a swim and then there were four.

Four little froggies looked out to sea,
One went swimming, and then there were three.
Three little froggies said, "What can we do?"
One jumped in the water and then there were two.
Two little froggies sat in the sun,
One swam off and then there was one.
One lonely froggie said, "This is no fun."
He dived into the water and then there was none.

GRASSHOPPERS

Ten little grasshoppers sitting on a vine;
(hold up ten fingers; fold one down at each count.)
One ate too much corn, and then there were nine.
Nine little grasshoppers swinging on a gate;
One fell off, then there were eight.
Eight little grasshoppers started off to Devon;
One lost his way, then there were seven.
Seven little grasshoppers lived between two bricks;
Along came a windstorm, then there were six.
Six little grasshoppers found a beehive;
One found a bumblebee, then there were five.
Five little grasshoppers playing on the floor;
Pussycat passed that way, then there were four.
Four little grasshoppers playing near a tree;
One chased a buzzy fly, then there were three.
Three little grasshoppers looked for pastures new;
A turkey gobbler saw them, then there were two.
Two little grasshoppers sitting in the sun;
A little boy went fishing, then there was one.
One little grasshopper left all alone;
He tried to find his brothers, then there was none.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to count to 100.

State Goal	1,7,8
District Goal	
Program Goal	1,2,5

Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Counting Game
Group Size: entire class
Materials: none needed

Procedure:

- . Teacher calls on someone to begin counting to 100. After a short time, the teacher says "stop" and calls on another student to continue where the first student left off.
- . Teacher continues this process with students until 100 is reached.

Title: Student Counting
Group Size: whole class
Materials: none

Procedure:

- . Designate one student as the counting starter.
- . Agree on the order in which the students are to "count off".
- . Starter begins with "one".
- . Other students count in turn and in sequence.
- . As soon as the last student "counts off", the counting starter picks up the counting sequence and the students continue to count.
- . The student who counts off "100" stands and becomes the new counting starter.

Variation:

- . Student could count backwards from 100 to 1.

Suggested Monitoring Procedures

Mini-Test: "Counting to 100"
Group Size: one student
Procedure:

- . Ask student to count from 1 to 100.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 126-127

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 70-72

Computation and Structure, The Nuffield Corporation, 1967, pp. 42-43

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to count objects to 10.

State Goal	1,7,8
District Goal	
Program Goal	1,2,5

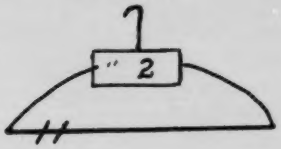
Related Area(s)

Suggested Activities: Grade(s) K

Title: Hangers and Clothespins
Group Size: individual
Materials: 10 hangers and 55 clothespins, 3"x5" tagboard strips with numerals written 1-10

Procedure:

- . Teacher fastens tagboard cards on hangers. Teacher directs student to put the appropriate number of clothespins on the hangers.

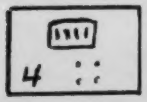


Title: Pincushions
Group Size: individual
Materials: 3" squares of cardboard, pincushions cut from foam rubber, glue, 55 large-headed pins, container for pins

Procedure:

- . Teacher marks tagboard strips with numerals and corresponding dots from 1-10. Teacher glues pincushions on tagboard strips.
- . Student then puts the appropriate number of pins into cushions.

Example:



Suggested Monitoring Procedures

Mini-Test: "Counting Objects to 10"
Group Size: one student
Materials: small box
10 counters

Procedure:

- . Ask the student to count the counters and to place each counter in the box as it is counted.

Possible Resources

Baratta-Lorton, Mary, Workjobs, Addison-Wesley Pub. Co., 1972, pp. 156-157 and pp. 130-131

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 117-119

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, 1973, pp. 61-65

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 521-522

Suggested Activities: Grade(s) K

Title: Counter Toss
Group Size: small group
Materials: bags containing sets of counters from 1-10

Procedure:

- Each student selects a bag and records estimate of number of counters in the bag.
- When all have recorded their estimates, the bags are spilled on a rug or table.
- In turn, the students touch each counter as they count aloud.
- When all have counted in turn, the student(s) who estimated the counters correctly stand.

Suggested Monitoring Procedures

Possible Resources

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, p. 102

Mathematics for Elementary School Teachers, National Council of Mathematics, 1966, pp. 11-14

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) The student is able to count objects to 50.

State Goal	1,7
District Goal	
Program Goal	1,2,5

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Collage
Group Size: small group
Materials: colored scraps of paper, sheet of paper 12"x18", glue

Procedure:
- Teacher directs students to make a collage of the fifty scraps of colored paper (by gluing the scraps to the large sheet).

Title: Collecting Stuff
Group Size: entire class
Materials: large container, rocks, leaves, twigs, pine cones, etc.

Procedure:
- Teacher takes class to a park or the school yard. Students collect various objects and place them in the container.
- When sufficient objects have been collected, students, one at a time, remove an object from the container and count it. Continue the process until the students reach 50.

Variation:
- Discuss groupings of objects. How many rocks, leaves, etc.? Group 5 types of objects to make 50.

Suggested Monitoring Procedures

Mini-Test "Counting Objects to 50"
Group Size: one student
Materials: small box
50 counters

Procedure:
- Ask the student to count the counters and to place each counter in the box as it is counted.

Possible Resources

Step Math Board (with counting strips)

District Resources

Suggested Activities: Grade(s) 1	Suggested Monitoring Procedures	Possible Resources
Title: Count to 50 Group Size: small group Materials: blocks, cubes, tongue depressors Procedure: . Each student is given cubes, blocks, etc. to count to see how many are in a group of a hundred. . If the students come up with 50 each, they exchange with a classmate to check the figure.		
Title: Count The Squares Group Size: individual or small group Materials: 1/2" graph paper Procedure: . Students are directed to county 50 squares and to draw a line around the area enclosing the 50 squares. Variation: . Students may color or mark each square as they count.		
Title: My Count Group Size: pairs Materials: small box, 50 counters Procedure: . Student counts as counters are placed one at a time in a box. . Student records the number of counters that were counted. . The other student takes the counters out of the box one at a time counting aloud. . The final "out loud count" is compared with the recorded count.		Baratta-Lorton, Mary, Workjobs, Addison-Wesley, 1972, pp. 142-143

SMALL SCHOOL ROJECT

Suggested Objective Placement 1

Student Learning Objective(s) The student is able to count objects to 50.

State Goal	1,7
District Goal	
Program Goal	1,2,5

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Count Me Out
Group Size: partners
Materials: 50 counters

Procedure:

- One student is the "caller". This student selects and says any number from 1 to 50, for example, thirty-seven.
- The other student counts out loud as each counter is separated from the set of 50 until thirty-seven counters are removed from the original set.

Suggested Monitoring Procedures

Possible Resources

Oberlin, Lynn, Let's Play Games in Mathematics, Volume One, National Textbook Co., 1970, pp. 23-24

District Resources

40

41

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to count by 2's to 100.

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Counting by Two's
Group Size: individual
Materials: large quantity of counters (beans, buttons, beads, styrofoam packing pellets, etc.), recording paper

Procedure:

- . Each student places a pile of counters on one side of his/her desk top.
- . The student removes two counters at a time from the pile saying, "2, 4, 6", etc., writing these numbers on recording paper as he/she counts.

Title: Counting Chains
Group Size: individual or partners
Materials: light gauge wire in 5 ft. lengths, buttons or styrofoam pellets

Procedure:

- . Working alone or in pairs, students thread a piece of wire with 100 counters (wire can be stuck through styrofoam like a needle). There will be some extra length of wire left.
- . Partner slides counters, two at a time, to the end, counting by 2's to 20. Then the other partner continues the process from 20 through 40. Repeat the procedure from 42 to 60 and on up by 2's to 100.

Suggested Monitoring Procedures

Mini-Test: "Counting by 2's"
Group Size: one student
Procedure:

- . Teacher asks student to count by 2's to 100.

Possible Resources

May, Lola J., Mathematics in Elementary School, New York: The Free Press, (Macmillan Co.), 1970, pp. 27-29

Marks, John L., Teaching Elementary School Mathematics for Understanding, McGraw-Hill Book Co., 1970, pp. 83-84

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, p. 52

District Resources

Suggested Activities: Grade(s) 1-2

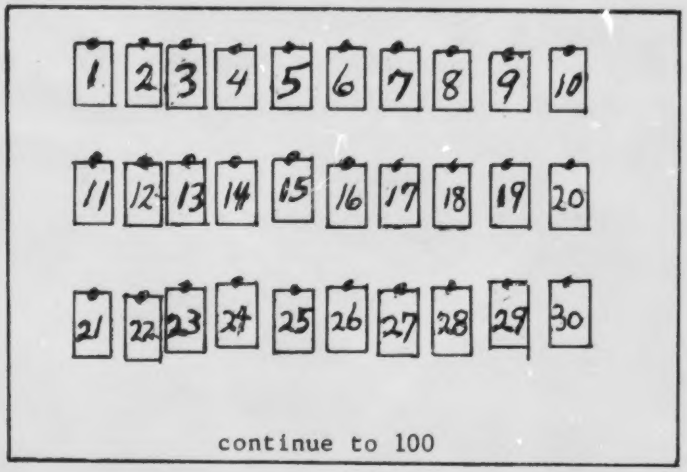
Title: Counting Board

Group Size: individual or partners

Materials: teacher-made counting board with rows of nails or pegboard hooks to hold number tags 1 to 100-odd numbers in red, even numbers yellow, and a second set in blue tags for numbers which are multiples of 5 (for counting by 5's, 10's); use paper punch to make a hole in each tag for hanging on board (see illustration)

Procedure:

- Student places all numbers on board in order. Student reads the yellow number tags in order across the board. (If desired, student may remove the red tags.) Point out to student that the yellow number tags form vertical rows on the board. Ask: "Which numbers are common in these rows?" (Answer: 2, 4, 6, 8, 0.)



continue to 100

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to count by 2's to 100.

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Swish
Group Size: small group
Materials: none

Procedure:

- The group will count out loud but instead of saying "two" or any multiple of two, the word "swish" will be substituted.
- Every time a mistake is made, that is, instead of "swish" a multiple of two such as "four" or "eight" is said, the group must begin again.
- Repeat until the group reaches 100.
- Compare the group's time with that of another group.

Title: Counting by Two's
Group Size: entire class
Materials: worksheet with puzzle

Procedure:

- Students decide what part of the puzzle is missing and fill in the correct number.

2			8
	6		
6			12
8	10		
	12		16

Suggested Monitoring Procedures

Possible Resources

Henderson, George, Let's Play Games in Mathematics: Volume 2, National Textbook Co., 1970, p. 21

Computation and Structure, The Nuffield Foundation, 1967, pp. 43-44

District Resources

Suggested Activities: Grade(s) 2

Suggested Monitoring Procedures

Possible Resources

Title: Counting by Two's
Group Size: partners
Materials: teacher-made card marked with even numbers 0-38, etc,
2 4
30 counters, 2 game cards (3"x5" matrix with arrangements of multiples of 2 from 2 through 40--vary the arrangements on the two cards.

Sample of one game card:

4	10	8	20	12
2	26	4	30	24
22	16	40	36	6

Procedure:

- Teacher designates student (or partners select one) to shuffle numeral cards.
- Students place the cards face down between them.
- Students take turns turning over the top card one card at a time.
- Students place a counter on a numeral that means 2 more than the numeral on the card just turned over.
- The first player to cover all the numerals in a row or column wins.

Extension:

- Count student's shoes, eyes, ears by one's, with emphasis on the idea there are pairs of each.
- Count sets of two's by one's, emphasizing the even number[illegible] (e.g., one, two, three, four, etc.).

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to count by 5's to 100.

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Five Fingers
Group Size: small group or entire class
Materials: chalkboard and chalk

Procedure:
- Students, one at a time, trace their hand on the chalkboard and write in the number on each hand.
- Students then write the number 5 times more than the preceding hand. This procedure should continue until the students reach 100.

Title: Counting by 5's on the Number Line
Group Size: small group/entire class
Materials: chalk and chalkboard

Procedure:
- Draw a large number line across the chalkboard (0-100)
- Have group count by 5's and have one student circle each multiple of 5's.

Suggested Monitoring Procedures

Students record the sets by five.

Teacher listens to the students taking turns counting the hands by five, or the counters by fives, orally.

Mini-Test: "Counting by 5's"
Group Size: one student
Procedure:
- Ask the student to count by 5's to 100.

Possible Resources

May, Lola, J., Teaching Mathematics in the Elementary School, New York: The Free Press, (Macmillan Co.), 1970, pp. 27-29

Marks, John L., Teaching Elementary School Mathematics for Understanding, McGraw-Hill, 1965, pp. 132-133

Henderson, George, Let's Play Games in Mathematics: Vol. 2, National Textbook Co., 1970, pp. 31-32

Bead Frame

Suggested Activities: Grade(s) 2

Title Counting by 5's
Group Size: pairs
Materials: numeral cards from 5 to 70 in multiples of 5, 18 counters, 2 game cards--teacher makes two different game cards; in a 3"x3" matrix write different arrangements of multiples of 5 from 5 through 70.

Sample of one game card:

10	75	15
30	55	20
25	40	35

Procedure:

. Teacher gives the following directions to students:
- (a) Shuffle the numeral cards.
- (b) Place the cards face down between the two students.
- (c) Take turns turning over the top card.
- (d) Place a block on the numeral that means 5 more than the numeral on the card turned over.
- (e) The first to cover all the numerals in a column or row wins.

Suggested Monitoring Procedures

Possible Resources

Pagne, Joseph N., Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 174

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to count by 5's to 100.

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources

Title: Solve The Puzzle
Group Size: entire class
Materials: worksheet of puzzle

Procedure:
- Students decide what parts of the puzzle are missing and fill in the correct number.

5	10	15	20
10		20	
15	20		30
	25		35
25			40
30	35	40	
	40	45	

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOO PROJECT

Suggested Objective Placement 1-2

State Goal	1
District Goal	
Program Goal	1,3,5

Student Learning Objective(s) The student is able to count by 10's to 100.

Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Groups of Ten
Group Size: individual or small group
Materials: counters, beads

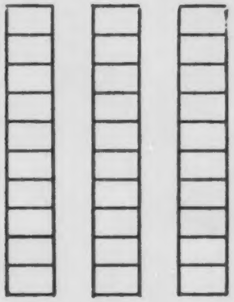
Procedure:

- The student will group the counters into groups of ten and then count these by ten.

Title: Graphs
Group Size: entire class, small groups
Materials: 1/2" graph paper

Procedure:

- Teacher directs student to cut graph paper into strips of ten and then count the strips by ten to 100.



Suggested Monitoring Procedures

Mini-Test: "Counting by 10's"
Group Size: one student
Procedure:

- Ask the student to count by 10's to 100.

Possible Resources

May, Lola J., Teaching Mathematics in the Elementary School, New York: The Free Press (Macmillan Co.), 1970, pp. 27-29

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 69-72

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 141-142

Sharp, F.A., These Kids Don't Count, Academic Therapy Publications, 1971, pp. 57-59

Bead Frame

Hundreds Chart

Suggested Activities: Grade(s) 1-2

Title: Ten Strips
Group Size: individual or small groups, entire class
Materials: strips of colored paper or dittos cut into strips

Procedure:

- Students will separate the paper strips into groups of ten. Students then count by ten's to see how many make 100.

Variation:

- Tongue depressors or bean sticks in bundles of ten may be used.

Title: Counting by 10's on the Number Line
Group Size: small group/entire class
Materials: chalk and chalkboard

Procedure:

- Draw a large number line across the chalkboard (0-100).
- Have the group/class count by 10's and have one student circle each multiple of tens.

Suggested Monitoring Procedures

Possible Resources

Henderson, George, Let's Play Games in Mathematics: Vol. 2, National Textbook Co., 1970, pp. 31-32

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to identify the position of objects first through tenth.

Related Area(s)

State Goal	1
District Goal	
Program Goal	1,3,5

Suggested Activities: Grade(s) K-1

Title: Train
Group Size: entire class divided into groups of 10
Materials: 10 chairs

Procedure:

- Teacher places a row of 10 chairs in front of the group (train fashion).
- Students sit in the chairs.
- Teacher gives the following directions orally:
  - (a) The first person in each train raise your hand, clap, stand up, etc.
  - (b) The second person raise your hand, etc.
- Teacher continues to give directions until each member has participated.
- Change train positions until each student has been in each chair.

Title: First Through Tenth
Group Size: class divided into groups of 5
Materials: none needed

Procedure:

- Teacher lines up the class into groups of five.
- Teacher gives directions orally, such as:
  - (a) The fifth person touch the floor.
  - (b) The third person tap the second person on the shoulder.
- Teacher continues until each student has been given a direction.

Suggested Monitoring Procedures

Mini-Test "Ordinals"
Group Size: one student
Materials: 10 counters
Procedure:

- Ask the student to place the 10 counters in a (horizontal) line in front of him/her.
- Then ask:
  - Show me the second counter, the fifth counter, etc., until all ordinals are tested.

Possible Resources

Moore, Dan, Explorations in Number Concepts, Denoyer-Gepper, 1972.

Pagne, Joseph N., Mathematics Learning in Early Childhood, N.C.T.M., 1976, p. 135

Skip, Donald E., Developing Arithmetic Concepts and Skills, Prentice Hall, Inc., 1964, p. 75

Henderson, George L., Let's Play Games in Mathematics, National Textbook Co., 1970, pp. 10-11

Suggested Activities: Grade(s) K

Suggested Monitoring Procedures

Possible Resources

Title: Popsicle Sticks
Group Size: entire class
Materials: 10 popsicle sticks per student, beans (at least 10 per student), glue

Procedure:

- Teacher gives each student a set of popsicle sticks and at least 55 beans.
- Teacher suggests that the student make a set of bean sticks by gluing one to ten beans on each of the 10 sticks.
- When the glue is dry, the students play a game of ordering their bean sticks, placing them from first to last.

Variation:

- Students may color the bean sticks different colors (for example, the first bean stick red).

Title: Moving Counters
Group Size: individual, small group
Materials: 10 counters per student

Procedure:

- Give the following directions to students: (in reference to the initial position)
  - (a) Place the counters in line from left to right.
  - (b) Remove the third counter.
  - (c) Place the second counter above the first counter.
  - (d) Place the fourth counter below the fifth counter, etc.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to identify the position of objects first through tenth.

Related Area(s)

State Goal	1
District Goal	
Program Goal	1,3,5

Suggested Activities: Grade(s) K-1

Title: Place Me In Order
Group Size: small or large group
Materials: 10 comic strip pictures, 10 cards with the ordinal numbers first through tenth

Procedure:

- Cut out and mount five frames of a comic strip on separate sheets of tagboard.
- Place the comic strip frames in order from left to right.
- Beneath each comic strip frame, place the ordinal word name.
- Check your answer by turning over each picture and matching the ordinal names.

Title: Ordinal Relay Race
Group Size: small or large group
Materials: chairs for each student

Procedure:

- Arrange students in two equal rows. Assign each student a name, indicating the position in the row (first, second, etc.--these can be written for the students to refer to).
- Each student stands behind a chair. The teacher directs: "Third person put hands on head." The student who complies first and correctly sits down.
- The teacher continues to give directions in this manner. The first row which is seated wins.

Suggested Monitoring Procedures

Possible Resources

Nelson, Doyle, Mathematical Experiences in Early Childhood, Encyclopedia Britannnica, Inc., 1972, pp. 48-53

Liedtke, Werner, Mathematical Experiences, Primary Division, Encyclopedia Britannica, 1974, pp. 28-30

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) The student is able to name the number before, after or between any number to 10.

State Goal 1

District Goal

Program Goal 1,3,5

Related Area(s)

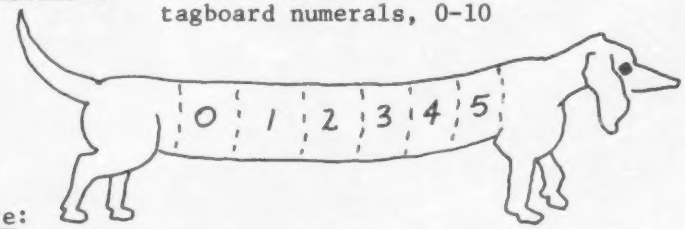
Suggested Activities: Grade(s) K-1

Title: Covered Number Line
Group Size: small group
Materials: 10 9"x12" laminated numerals, 10 9"x12" laminated covers

Procedure:

- Teacher tapes laminated numerals in a number line. Tape covers on the number line to facilitate covering and exposing the numerals.
- Teacher uncovers any number and asks students what number comes before, what number follows.
- Uncover every other number and ask students what number comes between the two numerals.

Title: Long Doggie
Group Size: individual
Materials: 9"x12" tagboard dachshund, 9"x12" tagboard numerals, 0-10



Procedure:

- Teacher places tagboard numerals in reverse order face down on a table.
- Teacher directs students to take the first number (0) and place it between the head and the tail.
- If the student can name the next numeral, he/she may place that number next to 0.
- This process continues until the student has completed the game or said an incorrect number.

Suggested Monitoring Procedures

Mini-Test: "Before, After, Between"
Group Size: entire class
Materials: written exercise as below

Procedure:

- Ask students to complete the following:

Before	After	Between
____4	1____	5____7
____6	9____	8____10
____1	7____	3____5

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart, Winston, 1973, p. 123

Kelley, Jeanne, Learning Mathematics Through Activities, James E. Freel * Associates, Inc., 1973, p. 24

Hundreds Board

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) The student is able to name the number before, after or between any number to 100.

State Goal 1
District Goal
Program Goal 1,3,5

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Counting Cards
Group Size: small group
Materials: cut tagboard or construction paper cards 2"x3", crayons or marking pens

Procedure:

- Teacher gives the following directions: Individual students write ten consecutive numerals on ten cards. Student A may write 1 through 10, student B from 11 to 20, student C from 21 to 30, and so on until there is a card for each numeral 1 through 100.
- Shuffle cards and give each pair of students about 20 cards. One student holds up a card and the partner must give either the number which would come before or after that numeral. (Keep the entire deck of cards for remedial drill.)

Suggested Monitoring Procedures

Teacher observes student's response to drill cards or verbal questions.

See previous Mini-Test.

Possible Resources

Pagne, Joseph N. (editor) Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 149

Hundreds Board

Step-Counting Board

District Resources

Suggested Activities: Grade(s) 2

Title: Counting Puzzle
Group Size: individual and partners
Materials: 10"x10" tagboard lined into 100 squares

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Procedure:

- Teacher writes numeral 1 to 100 consecutively, 10 numbers per row. Laminate or cover with clear contact paper. Cut out random squares from the puzzle. (Cut on marked lines to form puzzle pieces.)
- Have students assemble the puzzle by taking a number, naming the number which comes before and after.
- Students then place the number in the appropriate place in the puzzle.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) The student is able to name the number before, after or between any number to 100.

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Bureau of Missing Numbers
Group Size: small group
Materials: none needed

Procedure:

- Teacher gives clues involving descriptions of numbers and students guess the answers.
- Examples:

  "Attention all detectives! We have a missing number. He is even. He has an older sister who is four. Can you identify him?" (2)

  "Attention all detectives! A number is missing. It was last seen around the middle of the numeral line. It has five tens, it is odd and it is snaller than 53. What is it?" (51)

  "All cars be on the lookout for a missing number. It's hundred's place is an even number between 6 and 10. It's ten's place is 7. It's one's place is an odd number less than three. What is it?" (871)

Suggested Monitoring Procedures

Possible Resources

Kennedy, Leonard M., Models for Mathematics in the Elementary School, Wadsworth Publishing Co., 1967, p. 38

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student is able to name the number before, after or between any number to 1,000.

State Goal	1
District Goal	
Program Goal	1,3,5

Related Area(s)

Suggested Activities: Grade(s) 3

Title: Bureau of Missing Numbers
Group Size: small group
Materials: none needed

Procedure:

- Teacher says to class: "Today you may be detectives and investigate some missing numbers. Listen carefully for their descriptions. If you think you know the answer, raise your hand."

  Examples:

  "Attention all detectives! We have a missing number. It is even. It comes between 5 and 10. Can you identify it?" (6 or 8)

  "Officer's attention! Pick up a blue car doing just over 90. How fast is it going?" (91)

  "Robbery at the bank! Attention all squads! The robber got just under $1,000. What did he/she get?" ($999)

Suggested Monitoring Procedures

Teacher observes student's responses or verbal questions.

See previous Mini-Test.

Possible Resources

District Resources

Suggested Activities: Grade(s) 3

Suggested Monitoring Procedures

Possible Resources

Title: Fishbowl
Group Size: small groups
Materials: tagboard cards (3"x5"), fishbowl

Procedure:

- Teacher directs students to make cards 3"x5". Put the numerals on it to 1,000. Place the cards in a fishbowl.
- One student draws out a card and names the number that comes before or after it.
- All the correct answers receive 1 point. The player with the most points after all the cards are drawn is the winner.

Variation:

- The student draws two cards and names any numeral that comes between. Give a point for a correct answer.

District Resources

96

87

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Equality and Inequality

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. the symbol "=" means "equal to".)	43-	1-3					
. the symbol ">" means "greater than".) one activity		1-3					
. the symbol "<" means "less than".)		1-3					
The student is able to:							
. use one-to-one matching with sets of objects less than 10.	39-	K-1					
. compare sets of objects for equality and inequality using the words: "more than", "less than", and "equal to".	41-	K-1					
. compare the sets of objects by the use of symbols ">", "<", "=",	45	1					
*. compare numbers to 100 by the use of symbols ">", "<", "=".	47-	1-2					
. compare numbers to 999 by the use of symbols ">", "<", "=".	47-	2-3					
*. compare numerical expressions by the use of the symbols ">", "<", "=", i.e., 3 + 2 ☐ 4 + 1 10 + 4 ☐ 14 - 3 1 + 6 ☐ 10 - 1	51	2-3					
The student values:							

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ________________

Suggested Objective Placement K-1

Student Learning Objective(s) The student is able to use one-to-one matching with sets of objects less than 10.

State Goal 1

District Goal

Program Goal 3,4,5,7

Related Area(s)

Suggested Activities: Grade(s) K-1

Title: Mailing Time
Group Size: one student
Materials: 9 envelopes, 9 letters, 8 word stamps

Procedure:

- Have students match the letters to the envelopes.
- Student determines if there are enough stamps for each envelope.

Title: Musical Chairs
Group Size: small or large group
Materials: matched number of chairs with students

Procedure:

- As music is played, students circle around the chairs. The teacher moves a chair, stops the music and a student who fails to find a chair is eliminated. Repeat.

Title: Dot Cards
Group Size: one student
Materials: index cards

Procedure:

- Place the cards dot side down. Student picks a card. He/she must match the dots one-to-one with a set of objects. Students may select any set of objects. Students may continue the game until the cards have been matched correctly.

Suggested Monitoring Procedures

Paper and pencil test

Teachers elicit verbal response

Teacher observes daily activities in the classroom

Mini-Test "Matching Objects"
Group Size: one student
Materials: 6 counters
Procedure:

- Teacher forms 2 sets of counters, a set of 3 and a set of 3 counters.
- Teacher asks student to match the 2 sets

Possible Resources

Baratta-Lorton, Mary, Workjobs, Addison-Wesley Publishing Co., 1972

Kennedy, Leonard M., Models in the Elementary School, Belmont, California, Wadsworth Publishing Co., Inc., 1967, pp. 2-11

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel & Associates, Inc., 1973, pp. 18-19

Liedtke, Werner, Mathematical Experience, Primary Division, Encyclopedia Britannia Publications, Ltd., 1974, pp. 12-14

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 131-133

Suggested Activities: Grade(s) K-1

Title: Matching Jars and Lids
Group Size: one
Materials: set of jars (varying in style)
set of lids (varying in style)

Procedure:
- Have students match lids to jar by screwing lids on jars.

Title: Color Match
Group Size: one
Materials: 5 tongue depressors, 5 crayons of different colors

Procedure:
- Teacher colors each tongue depressor with a different color crayon.
- Match each colored tongue depressor to a crayon of the same color.

Title: Number Cans
Group Size: individual
Materials: 9 orange juice cans covered with contact paper, round adhesive labels, tongue depressors (may be spray painted to resist soil)

Procedure:
- Teacher puts dots on can - each can having a different number of dots from 1-9.
- Student places tongue depressors into the can as indicated by the dot on outside of can.

Suggested Monitoring Procedures

Possible Resources

Ginsberg, Herbert, Children's Arithmetic: The Learning Process, D. Van Nostrand Co., 1977, chapter 2

Bean Sticks
Step Board
Magnetic One-More-Than Strips
Set Cards
Ice Cream Cones
Art-Foam Sets
Number and Numeral Puzzle

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) The student is able to compare sets of objects for equality and inequality using the words "more than", "less than" and "equal to".

State Goal	1
District Goal	
Program Goal	3,4,5,7

Related Area(s)

Suggested Activities: Grade(s) K-1

Title: Sets
Group Size: small or large group
Materials: paper, crayons

Procedure:

- Each student draws a set on a piece of paper using no more than nine members to the set.
- Select a student to come to the front of the group and show his/her set to the class. Ask the student who have a set with more members, fewer members or the same number of members to show their sets.

Title: Dots
Group Size: small group
Materials: 12 3"x5" index cards on which are drawn sets of dots (1 to 5)

Procedure:

- Place the index cards face down in the rows of 4 each. A student turns over one card and then a second. If the second card has fewer dots than the first, the student keeps the pair.
- If the second card has more dots or the same number of dots, both cards are turned face down, and the other player gets a turn.

Variation:

- If the second card has more dots the student keeps the pair. If the cards have an equal number of dots, the cards are turned down.

Suggested Monitoring Procedures

Mini-Test: "Comparing Sets"
Group Size: one student
Materials: 7 counters
Procedure:

- Teacher forms 2 sets, one with 4 counters, the other with 3 counters.
- Student compares the 2 sets using any method and determines which set contains "more than" or "less than" the other.
- Then ask the student what must be done to make one set "equal to" the other.

Possible Resources

May, Lola J., Teaching Mathematics in the Elementary School, New York: The Free Press (Macmillan Co.), 1970, pp. 23-25

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 59-61

Schminke, C. W., Teaching the Child Mathematics, The Dryden Press, Inc., 1973, pp. 100-105

Ginsburg, Herbert, Children's Arithmetic, The Learning Process, D. Van Nostrand Co., 1977, chapter 2

Bean Sticks

District Resources

Suggested Activities: Grade(s) K-1

Title: Fall Walk
Group Size: small or large group
Materials: park or school yard with leaves, twigs, rocks, pine cones

Procedure:

- Take the students on a visit to a park or the school yard during the fall.
- Teacher gives directions using objects from the environment.

Example

- "Find 6 rocks and 5 leaves. Which set has more? Which set has less?"
  "Find a set of rocks that is less than 5."
  "Find a set of leaves that is more than 3."
  "Find a set of twigs less than 7."
  "Now find a partner who has 1 less than you."
  "Find a partner who has 1 more than you."

Can also do two more or two less:
"Find 3 leaves. Arrange them so that the middle leaf is greater than the one on the left and less than the one on the right."

Note: Be sure students return the objects to where they found them and discuss why.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) A. The student knows the symbol "=" means "equal to". B. The student knows the symbol ">" means "greater than". C. The student knows the symbol "<" means "less than".

State Goal	1
District Goal	
Program Goal	3,4,5,7

Related Area(s) ________

Suggested Activities: Grade(s) 1-3

Title: Equalities and Inequalities
Group Size: partners
Materials: 2 sets of cards (symbol and word cards)

=	equal	>	greater than
<	less than		

12 cards in each set.

Procedure:

- One player lays down one card at a time.
- The partner must match each card, e.g.

<	<	or	<	less than

- If the match of cards is correct the player keeps both cards.
- If the cards do not match, the cards are placed in a discard pile.
- After all cards are played, record the number of cards that were kept.
- Reverse roles.
- The winner is the player who took the most cards.

Suggested Monitoring Procedures

Possible Resources

Henderson, George L., Let's Play Games in Mathematics, National Textbook Co., 1970, p. 34

District Resources

Suggested Activities: Grade(s) 1-3

Title: Symbol Cards $\boxed{1}\ \boxed{2}\ \boxed{3}$ etc.
Group Size: three students
Materials: two sets of numeral cards (1-9); cards about the size of regular playing cards; three symbol cards marked "<", ">" and "=" e.g.,

$\boxed{<}\ \boxed{>}\ \boxed{=}$

Procedure:

- One player takes the symbol cards, sits between the other two players, and turns the symbol cards face up.
- The other two players each take a set of numeral cards (1-9), shuffle them and place them face down in front of each other.
- The player to the left of the player having the symbol cards takes one numeral card and turns it face up.
- The player to the right of the player having the symbol cards takes a numeral card off the top of the deck and turns it face up.
- The third player places the correct symbol card (>, <, or =) between the two numeral cards. If the correct symbol card is played, the player who played the correct symbol card keeps both numeral cards and takes back the symbol card that was played.
- If the wrong symbol card is played, the two numeral cards are placed in a discard pile.
- After all the numeral cards have been played, the player with the symbol cards counts and records the number of numeral cards he/she has.
- Players exchange positions until all three have a turn playing the symbol cards.
- The winner is the player who took the most numeral cards.

Suggested Monitoring Procedures

Possible Resources

Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, p. 14

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to compare the sets of objects by the use of symbols ">", "<" and "=".

Related Area(s)

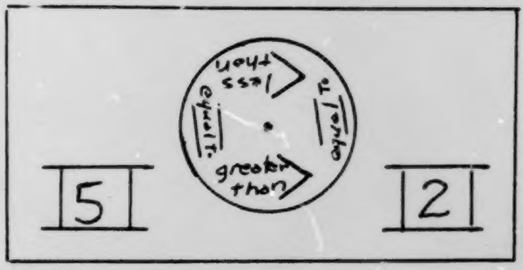
State Goal	1
District Goal	
Program Goal	5

Suggested Activities: Grade(s) 1-2

Title: Greater Than, Less Than Wheel
Group Size: individual, partners or group
Materials: 5"x7" cards of railroad board, one for each student

Procedure:

- Using a brad attach a 3" circle in the center of the rectangle, allowing the circle to rotate. Cut parallel slits in each side of the circle.
- On the circle mark symbols for "less than" and "greater than" and "equal".
- Use strips of paper or vinyl to slide through the slits showing numbers 0 to 9. (Ends of strips can be glued together to form loops so they won't slip out.) Students can help making these cards.



- Partners use card, moving number strips and adjusting symbol wheel to make a true statement. Partners check each other. Or, one student can move both number strips and the partner can adjust the symbol wheel to make a true statement.

Suggested Monitoring Procedures

Mini-Test: "Symbols"
Group Size: small group
Materials: set of 3 symbol card cards for each student $\boxed{<}$ $\boxed{>}$ $\boxed{}$ and counters

Procedure:

- Ask the students to form a set of four counters on their left and a set of five on their right.
- Place the correct symbol card $\boxed{>}$ between the two sets of objects.
- Ask the students to form a set of two counters on their left and a set of five counters on their right.
- Place the correct symbol card $\boxed{<}$ in position.
- Form equivalent sets so that $\boxed{=}$ card is used.

Possible Resources

D'Augustine, Charles H., *Multiple Methods of Teaching Mathematics in the Elementary School*, 1973, pp. 68-69

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student is able to compare numbers to 100 by the use of symbols "<", ">", and "=". B. The student can compare the numbers to 999 by the use of symbols "<", ">", "=".

State Goal	1
District Goal	
Program Goal	3,6

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Greater Than Or Less Than Cards
Group Size: small group
Materials: cards or slips of paper with numbers from 1-100 (for each student)

Procedure:
- (Note: Students should have prior knowledge of meaning of "<", ">", and "="; should be able to count to 100 and to 999.
- Student shuffle slips of paper or cards and place them face down.
- Each player then draws the top slip of card. The player having the greater number says: "My ________ is greater than your _______, so I win." The winner keeps the cards face up in another pile.

Variation:
- Use numbers from 100-200, 1-999, etc.

Title: Who Is Greater Or Less Than?
Group Size: entire class divided into two teams
Materials: 2 sets of large cards with the number you are working with, 2 sets of large cards with "<" and ">" drawn on them.

Procedure:
- Teacher gives each team a set of numeral cards and a "<" and a ">" sign.
- Teams stand on opposite sides of the room.
- Teacher calls out two numbers, e.g., 50 and 3.

Suggested Monitoring Procedures

Mini-Test: "Comparing Numbers"
Group Size: entire class
Materials: written exercise as below.

Procedure:
- Ask the students to compare: Use =, >, <.

3 __<__ 7
45 _____ 46
19 _____ 19
248 _____ 127

Possible Resources

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 68-69

Step Counting Board

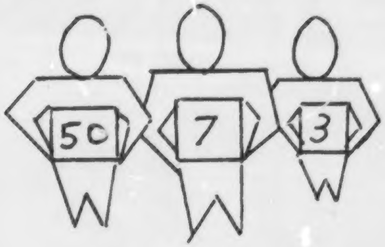
District Resources

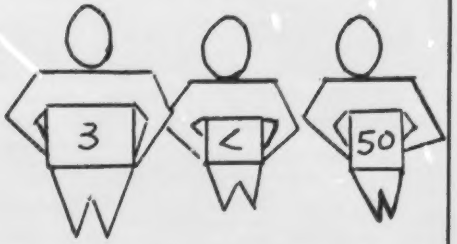
Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

- The first two students on each team find the numbers. The third student picks out the correct sign. The students then go to the front of the room and position themselves correctly:





- Award a point to the first team whose three members have positioned themselves correctly. The students with the highest number possible get a point. Continue playing for a predetermined number of turns. Example: spin numbers 3, 7, 5. Possible combinations would be 753 (the largest) or 573, 375, 735, etc.

  Variation:
- Smallest number gets winning point. Add two sets of 3-place numbers to get the largest or smallest answer.

District Resources

Suggested Objective Placement 2-3

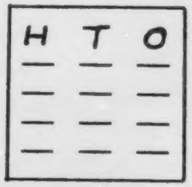
Student Learning Objective(s) A. The student is able to compare numbers to 100 by the use of symbols "<", ">" and "=". B. The student can compare the numbers to 999 by the use of symbols "<", ">", "=".

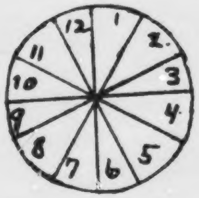
State Goal	1
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Spatt Card Game
Group Size: small groups, pairs
Materials: spinner card (dice could be used)
record sheet (ditto or student-made)
with columns marked H (hundreds), T (tens) and O (ones)





Procedure:

- Teacher gives each student a record sheet and a pencil.
- One player spins the spinner. All the players write the numbers on their record sheets in any column they want (hundreds, tens, ones).
- The leader spins the spinner two more times. After each spin, the students fill in another place value blank.
- The object is to make the largest possible number, but chance may overrule logic.

Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources
113		114

SMALL SCHOOLS PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) The student is able to compare numerical expressions by the use of the symbols ">", "<", and "=", i.e., $3 + 2 \boxed{=} 4 + 1$

$10 + 4 \boxed{>} 14 - 3$

Related Area(s) $1 + 6 \boxed{<} 10 - 1$

State Goal	1
District Goal	
Program Goal	

Suggested Activities: Grade(s) 2-3

Title: Paper Clip Chains
Group Size: one student
Materials: 33 paper clips

Procedure:
- Make chains of 3, 8 and 10 paper clips.
- Put two chains together to show 3 + 8.
- Compare the 3 + 8 chain with the 10 chain.
- Use <, =, or > to complete this sentence:
  3 + 8 _____ 10
- Make chains for the numbers in each of the following sentences. Use them to help you complete each sentence.

9 + 4 ___ 13 3 + 6 ___ 11 - 3 8 + 8 ___ 17 - 2

Suggested Monitoring Procedures

Mini-Test "Number Phrases"
Group Size: entire class
Materials: written exercise, as below

Procedure:
- Teacher asks student to compare: Use =, <, >.

$2 + 3 \boxed{} 3 + 2$

$4 + 5 \boxed{} 6 + 2$

$2 + 7 \boxed{} 5 + 5$

Possible Resources

Lovell, Kenneth, The Growth of Understanding in Mathematics, Holt, Rinehart and Winston, 1971, pp. 63-65

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, p. 155

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources
117		118

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Reading and Writing Numerals

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4
The student knows:							
The student is able to:							
. read the numerals to 10.	55-	K					
*. read the numerals to 100.	59-	1-2					
. read any of the numerals to 999.	61-	2-3					
*. read any of the numerals to 9,999.	63	3-4					
. write the numerals to 10.	65-	K					
. write the numerals to 100.	69-	1-2					
. write any of the numerals to 999.	73	2-3					
. read and write the number words to 10.	75-	1-2					
. read the critical number words, i.e., ones, tens, hundreds, ten, twenty, thirty, etc.	79	2-4					
. write the numerals by two's to 100.	81-	1-2					
. write the numerals by five's to 100.	81-	1-2					
*. write the numerals by ten's to 100.	81-	1-2					
The student values:							
. the ability to read and write numerals as a useful skill in daily living.	91	K-3					

119

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOOLS PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to read the numerals to 10.

State Goal	1
District Goal	
Program Goal	5

Related Area(s)

Suggested Activities: Grade(s) K

Title:

Group Size: small group/entire class

Materials: one large number line to be hung from top of the chalkboard or laid out on the floor -- each number has an attached cover which may be flipped over one at a time.

0	1	2	3	4	5	6	7	8	9	10

Procedure:

- Write the numbers 0-10 very large. Place them in order side by side. Tape or laminate the sheets into one continuous strip. (Student models could also be made.)
- Have the student cover the number as the student reads it, or.
- Have the student guess and uncover what comes next.

122

Suggested Monitoring Procedures

Mini-Test: "Reading Numerals to 10"

Group Size: one student

Materials: numerals from 0-10 presented in random order on chalkboard, flannelboard, paper, etc.

Procedure:

- Teacher points to numerals one at a time and has the student name the numeral.

Example:

8 3 7 2 5 0 4 1 9 6

Possible Resources

Number Concept Cards
Peg Numbers
Picture Number Puzzle
Available through Jays Catalog, 1976, p. 3

District Resources

123

Suggested Activities: Grade(s) ________	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOO PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to read the numerals to 10.

State Goal	1, 8
District Goal	
Program Goal	1, 5

Related Area(s)

Suggested Activities: Grade(s) K

Title: Number Line Count
Group Size: small group/entire class
Materials: large numer line to 10

Procedure:
- Cover "0".
- Students read numerals in order from 1-10.
- Unocver "0" and students read.
- Teacher, then, points to the numerals in random order and students give the word name for each.

Suggested Monitoring Procedures

Possible Resources

Sharp, F.A., These Kids Don't Count, Academic Therapy Publications, 1971, p. 27

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to read the numerals to 100.

State Goal	1,8
District Goal	
Program Goal	1,5

Related Area(s)

Suggested Activities: Grade(s) 1

Title:
Group Size: small group
Materials: pointer, number line to 100

Procedure:

- Student or teacher points to any number on the number line, calling on another student to give the word names to five different numerals.
- If the student can do this he/she can take a turn with the pointer and call on any student to name five other numerals.
- The rest of the student monitor this and if the one who is reading the numeral makes a mistake, another student is chosen to read the numerals.

Title:
Group Size: student or students
Materials: flash cards with numbers to 100

Procedure:

- Two students take turns giving the flash cards to each other or one student gives the cards to a group.
- The first person in the group who gives the correct response receives the card. The winner has the most cards and that student, in turn, holds up the individual cards for the other(s) to say.
- This activity can be done by the teacher with an entire group.

Suggested Monitoring Procedures

Mini-Test: "Reading Numerals to 100"
Group Size: one student
Materials: selected numerals from 0-100 presented in random order on chalkboard, flannel-board, paper, etc.

Procedure:

- Teacher points to the numerals one at a time and has the student name the numeral

Possible Resources

Sharp, F.A., These Kids Don't Count, Academic Therapy Publications, 1971, pp. 20-25

District Resources

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources

Title:

Group Size: small group with similar reading/spelling skills

Materials: dictionary with numerals to 100 or more for each student

Procedure:

- The teacher writes word on chalkboard for students to find in their dictionary. As students find the word they stand up.
- When three, four or five people are standing, the teacher asks one of the students to give the page number on which the word is found.

District Resources

Suggested Objective Placement 2-3

Student Learning Objective(s) The student is able to read any of the numerals to 999.

State Goal	1
District Goal	
Program Goal	2,5,7

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Say It Right
Group Size: entire classroom/groups
Materials: any of the following: numbered cards 0-999, number line 0-999, number board 0-999; pointer or number line which goes around the room

Procedure:

- Teacher points to a numeral at random. Students are to read them, or hold up a flash card and have student read it.

Title: Color Out
Group Size: small group or entire class
Materials: worksheet with number boards to 999 (can be made by students), crayons

0 1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18

to

999

Suggested Monitoring Procedures

Mini-Test: "Reading Numerals to 999"
Group Size: one student
Materials: selected numerals from 0-999 presented in random order on chalkboard, flannel-board, paper, etc.

Procedure:

- Teacher points to the numerals one at a time and has the student name the numeral.

Possible Resources

Sharp, F.A., *These Kids Don't Count*, Academic Therapy Publica-

D'Augustine, Charles, *Multiple Methods of Teaching Mathematics in the Elementary School*, Harper and Row, 1973, pp. 77-78.

District Resources

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Procedure: . Teacher directs students to count by one's, ten's, five's, two's, etc. . Students circle each numeral as it is called or read out. . Students draw red circles for the ten's, blue for the five's, and so on. . After each, students describe any pattern they see.		

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student is able to read any of the numerals to 9,999.

State Goal	1
District Goal	
Program Goal	5

Related Area(s)

Suggested Activities: Grade(s) 3-4

Title: Tic-Tac-Toe
Group Size: partners with teacher supervision
Materials: worksheet for tic-tac-toe, 1"x2" cards with numerals to 9,999 written on them.

Procedure:

- Teacher makes flash cards with numerals to 9,999 and places them face down on table. Students have one tic-tac-toe worksheet.
- One student takes a card from the stock and if he/she reads it correctly, places an X or an 0 in the square of his choice. If he/she is incorrect and the other student knows the answer, the other student gets to place an X or 0 in the square of his choice.
- If both students are incorrect, teacher reads the numeral to both students and places it back in the piles.
- Follow these procedures until one student gets a tic-tac-toe.

Suggested Monitoring Procedures

Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 79

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to write the numerals to 10.

State Goal	1
District Goal	
Program Goal	2,5

Related Area(s)

Suggested Activities: Grade(s) K

Title: Formboards
Group Size: group of ten
Materials: 10 pie tins, plaster of paris into each pie tin

Procedure:

- Trace out a numeral in each pie tin. After the numerals have hardened, have each student trace his/her finger over the shape.
- Lay a sheet of paper over the form and the student writes the number, tracing the form.

Title: Salt Boxes
Group Size: small group
Materials: old ditto boxes, salt or sand

Procedure:

- Pour salt or sand into the boxes and students practice tracing numerals in the salt box.
- Have students practice making the numerals in the air.
- Have students write the numerals first on extra large sheets of paper, gradually reducing the size of the paper.

Suggested Monitoring Procedures

Mini-Test: "Writing Numerals to 10"
Group Size: entire class
Materials: paper and pencil
Procedure:

- Teacher says the numerals to 10 in random order.
- Students write each numeral in turn
- Teacher asks students to write numerals in order from memory (1-10)

Possible Resources

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley Publishing Co., pp. 44-47, p. 50.

Pagne, Joseph N., Mathematics Learning in Early Childhood, National Council of Mathematics, 1976, p. 135.

Sharp, F. A., These Kids Don't Count, Academic Therapy Publications, 1971, pp. 15-16

Ginsburg, Herbert, Children's Arithmetic: The Learning Process, D. Van Nostrand Co., 1977, chp. 5.

Kennedy, Leonard M., Models for Mathematics in the Elementary School, Wadsworth Publishing Co., 1967, p. 17

Reisman, Fredricka K., A Guide to the Diagnostic Teaching of Arithmetic, Charles E. Merrill Publishing Co., 1972, p. 91

Shipp, Donald E., Developing Arithmetic Concepts and Skills, Prentice-Hall, Inc., 1964, p. 81

Suggested Activities: Grade(s) K

Suggested Monitoring Procedures

Possible Resources

Title: Step Board Trace
Group Size: individual
Materials: step board

Procedure:

- Have students place paper over numerals of a step board and trace the numerals.

Title: Writing Numbers Rhyme
Group Size: individual/entire class
Materials: paper, pencils

Procedure:

- As students practice writing the numbers, teach them the following rhymes:

0 A zero goes around for a ride with nothing inside.

1 A straight line down is one - that's fun.

2 Around and back on a railroad track - two, two, two.

3 Around a tree and around a tree - is three.

4 Down and over - then down once more - that's four.

5 Five goes down and around. Put a hat on and see what you've got.

6 Down to a loop. A six rolls a hoop.

7 Across the sky and down from heaven - that's seven.

8 Around to me; away around; down and back to me; then cross up and away.

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to write the numerals to 10.

State Goal	1
District Goal	
Program Goal	2,5

Related Area(s)

Suggested Activities: Grade(s) K

9 Round a loop and down a line - makes a nine.

10 A one and a zero. Big ten is a hero.

Title: Math Recording
Group Size: individual
Materials: 10 6"x6" squares of cardboard, objects to form sets from 0-10, marking pen, glue, answer card

Procedure:

- Teacher glues objects to cards and labels each card, e.g., ____________ pegs.
- Student records what he/she sees on each answer sheet.

______ pegs

6"x6" card

3 pegs answer card

Suggested Monitoring Procedures

Teacher observation of student activities.

Possible Resources

District Resources

Suggested Activities: Grade(s) K

Suggested Monitoring Procedures

Possible Resources

Title: Numerals and Stars
Group Size: individual
Materials: laminated cards with the numerals 0-10 on them, marking pencil

Procedure:

- Teacher writes numerals 0-10 on the laminated cards. Student draws on sets of stars corresponding to the correct numeral.

Title: Show and Write
Group Size: individual
Materials: counters, paper, pencil

Procedure:

- Make 10 sets of counters.
- Let set one contain one object.
- Write the numeral representing the set.
- Let set two contain two objects.
- Write the numeral representing the set.
- Let set three contain three objects.
- Write the numeral representing the set.
- Continue making sets until the last set is made with ten objects.
- Write the numeral representing the last set.
- Put the numerals in order from one to ten.
- Have students use these sets when writing the numerals to ten.

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to write the numerals to 100.

State Goal 1

District Goal

Program Goal 7

Related Area(s)

Suggested Activities: Grade(s) 2

Title:
Group Size: entire class
Materials: 1" graph paper, pencil, color

Procedure:

- Students place the numerals in the squares to see how many squares, or writes the numerals in the squares. (Write 1 to 10 on the first row, 11 to 20 on the second, 21 to 30, etc.)

Title: One Hundred
Group Size: individual or small groups
Materials: graph paper (or ordinary paper), pencil

Procedure:

- Teacher gives random number between 0 and 100. Student will continue writing the consecutive numbers to 100 or another predetermined number less than 100.

Suggested Monitoring Procedures

Mini-Test: "Writing Numerals to 100"
Group Size: entire class
Materials: paper and pencil
Procedure:

- Teacher asks students to write selected numerals in random order.
- Students write each numeral in turn.
- Teacher asks students to write numerals in order (1-100) from memory in rows of 10.

Possible Resources

Sharp, F.A., *These Kids Don't Count*, Academic Therapy Publications, 1971, pp. 18-19

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL[illegible]ROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to write the numerals to 100.

State Goal 1

District Goal

Program Goal 7

Related Area(s)

Suggested Activities: Grade(s) 1

Title:
Group Size: entire class
Materials: 1" graph paper, pencil

Procedure:

- Students place the numerals in the squares to see how many squares, or writes the numerals in the squares. (Write 1 to 10 on the first row, 11 to 20 on the second, 21 to 30, etc.)

Title: Missing Number Puzzle
Group Size: individual or entire class
Materials: worksheet puzzle

Procedure:

- Have students fill in the missing numerals to the puzzle.

Example:

47	48		50	
		50		52
49	50		52	
		52		54
51				55

Suggested Monitoring Procedures

Teacher checks the written work of the students.

Students check each other's work.

Possible Resources

Pagne, Joseph N. (editor), *Mathematics Learning in Early Childhood*, National Council of Teachers of Mathematics, 1976, p. 148

District Resources

Suggested Activities: Grade(s) 1	Suggested Monitoring Procedures	Possible Resources
Title: Grab Bag Group Size: partners Materials: a bag with a large set of objects, pencil and paper		Henderson, George, Let's Play Games in Mathematics: Volume 2, National Textbook Co., 1970, p. 77

Procedure:

- One student reaches into the bag and removes his/her choice of the objects.
- This student writes a numeral representing the number of objects that were taken.
- The partner counts the remaining objects in the sack and records the number.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student is able to write any of the numerals to 999.

Related Area(s)

State Goal	1
District Goal	
Program Goal	3,5,7

Suggested Activities: Grade(s) 2-3

Title: Numeral Sequence
Group Size: entire class
Materials: 1/2" graph paper, pencil, coloring crayon

Procedure:

- Students write the numerals in the squares to see how many squares there are.

Extension:

- Color the multiples of three's orange, four's green, five's yellow, etc. "Is there a pattern?"

Title: Write One and Ten More
Group Size: small group or entire class
Materials: pencil, paper

Procedure:

- The students will write the numbers as the teacher calls them off, or,
- The students will write the numbers, read off by the teacher or a student, and the following ten numerals (e.g., teacher says "789". Student writes 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799.).

Suggested Monitoring Procedures

Mini-Test: "Writing Numerals to 999"
Group Size: entire class
Materials: paper and pencil
Procedure:

- Teacher asks class to write selected numerals given in random order.
- Students write each numeral in turn.

Possible Resources

Sharp, F. A., These Kids Don't Count, Academic Therapy Publications, 1971, pp. 60-65

Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, pp. 11-12

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to read and write the number words to ten.

State Goal	1
District Goal	
Program Goal	1,2,5

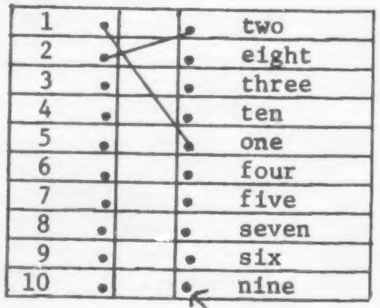
Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Lacing Board
Group Size: individual
Materials: 9"x11" lacing board and yarn (shoelace, string)

Answer Card

1.	one
2.	two
3.	three
4.	four
5.	five
6.	six
7.	seven
8.	eight
9.	nine
10.	ten



punched holes

Procedure:

- Student laces numbers with respective number words. When the lacing is completed, the student may check response by using the answer card in the pocket behind the board.

Suggested Monitoring Procedures

Mini-Test: "Write and Read Number Words"
Group Size: entire class write number words/individuals read number words
Materials: paper and pencil
Procedure:

- Ask the class to write the number words from zero to ten as they are dictated by the teacher in random order.
- Students read the number words back to the teacher. After the words have been written, they are read back too in random order. The teacher points to each word to be read.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, p. 122

Shipp, Donald E., Developing Arithmetic Concepts and Skills, Prentice-Hall, Inc., 1964, pp. 79-80.

Kane, Robert, Helping Children Read Mathematics, American Book Co., 1974, pp. 62-63

District Resources

Suggested Activities: Grade(s) 1-2

Suggested Monitoring Procedures

Possible Resources

Title: Number Words and Stars
Group Size: partners
Materials: 11 blank cards for each student

Procedure:
- Have the students:
  - Write the number words zero to ten on the blank cards.
  - Place the cards in order from left to right beginning with zero.
  - Draw stars on each number card to show the number named by each number word.
  - Compare the order of their number cards with that of their partners'.
  - Compare the number of stars on each card with their partners'.

Title: Number Words
Group Size: partners
Materials: slate or yarn

Procedure:
- Have students practice writing number words with partners on small chalk slates and write number words using yarn on colored paper.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to read and write the number words to ten.

State Goal 1

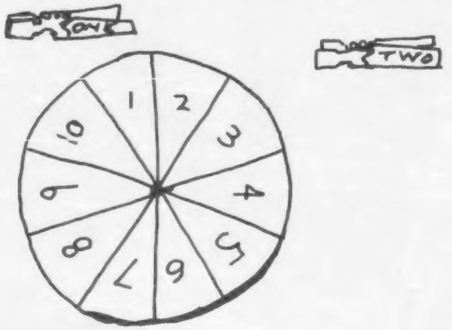
District Goal

Program Goal 1,2,5

Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Number Wheel
Group Size: individual
Materials: 10 clothes pins (clip-on kind) with numbers 1-10 written on them



Procedure:

- The student takes a clothespin and pins the number word to correspond with the number on the wheel. The number word is written on the back so the student can check his own.

Suggested Monitoring Procedures

Give a spelling test of number words written from 1-10.

The student will be able to write these correctly.

Possible Resources

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student is able to read the critical number words, e.g., ones, tens, hundreds, ten, twenty, thirty, etc.

State Goal	1
District Goal	
Program Goal	1,2

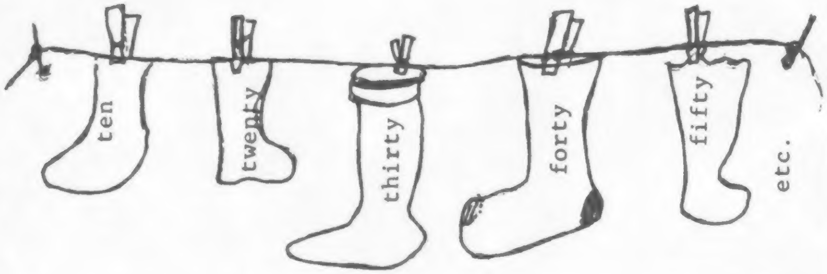
Related Area(s) Reading, Spelling, Language

Suggested Activities: Grade(s) 2-3

Title: What's Your Hangup?
Group Size: small group
Materials: clothesline, paper socks with the number words on them, clothespins

Procedure:

- Hang a clothesline (or wire) across one end of the room (e.g., between two tables or across the bottom of a bulletin board).
- Mark regularly spaced intervals with a magic marker along the rope.
- Provide one or more sets of "socks". Each sock should bear a number word.
- Provide a sack of clothespins and a sack for the socks.
- Ask students to order the numerals in each set and hang them at the proper intervals.



Suggested Monitoring Procedures

Mini-Test: "Critical Number Words"
Group Size: one student
Materials: cards with the critical number words printed on them

Procedure:

- Ask the student to shuffle the critical number words and place them face down on a table.
- Student turns over the number words one at a time and reads the number words to the teacher or his/her partner.
- Words are placed in two piles when read, the "correct" pile and the "incorrect" pile.
- At the end of the Mini-Test student copies and studies any number words that were incorrect.

Possible Resources

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student is able to write the numerals by two's to 100. B. The student is able to write the numerals by five's to 100. C. The student is able to write the numerals by ten's to 100.

State Goal	1.7
District Goal	
Program Goal	5

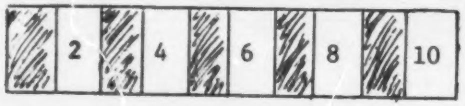
Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Counting by Two's
Group Size: small/large
Materials: 1/2" ruled graph paper, crayon, pencil

Procedure:

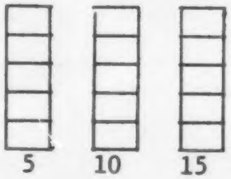
- Each student is given a graph paper of 100 squares and will color the first square, skip the second, color the third, etc. Thus, the student will color every other square.
- When the student has finished, each student will take his/her pencil and write the numerals by two's in every square that is not colored.



Title: Counting by Five's
Group Size: students or student/small group
Materials: graph paper, scissors, pencil

Procedure:

- The student will cut the graph paper into sets of five and then record the numbers by 5's to 100.



etc.

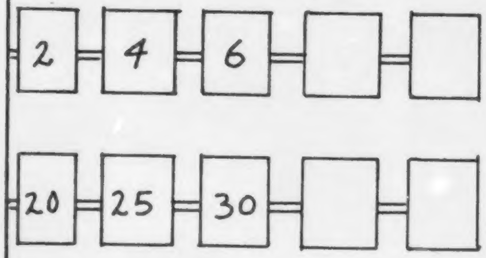
Suggested Monitoring Procedures

Teacher checks the students' written work of 2's, 5's and 10's to 100 with a test sheet.

Mini-Test: "Writing by Two's and Five's"
Group Size: entire class
Materials: written exercise such as one below

Procedure:

- Ask students to write the missing numerals:



Possible Resources

May, Lola, Mathematics Games for All Grades, Teacher's Publishing Corporation, 1969, pp. 12-13

May, Lola J., Teaching Mathematics in the Elementary School, The Free Press (Macmillan Co.), 1970, pp. 27-29

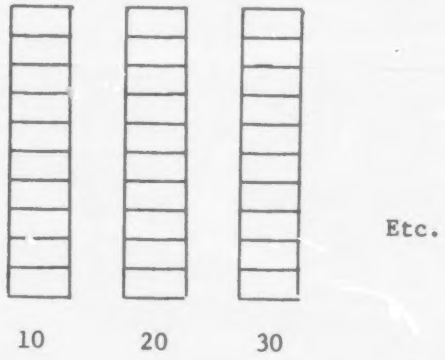
District Resources

Suggested Activities: Grade(s) 1-2

Title: Counting by Ten's
Group Size: small
Materials: graph paper, scissors, pencil

Procedure:

- Students cut graph paper into strips of ten squares each out of the 100 square paper. After cutting the paper into ten-squared paper, the students record their findings by 10's.



Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student is able to write the numerals by two's to 100. B. The student is able to write the numerals by five's to 100. C. The student is able to write the numerals by ten's to 100.

State Goal	1,7
District Goal	
Program Goal	5

Related Area(s)

Suggested Activities: Grade(s) 2

Title:
Group Size: student or students
Materials: 1/2" ruled graph paper, crayon, pencil

Procedure:

- Each student is given a graph paper of 100 squares and will color the first square, skip the second, color the third, etc. Thus the student will color every other square.
- When the student has finished each student will take his/her pencil and write the numerals by two's in every square that is not colored.

▨	2	▨	4	▨	6	▨	8	▨	10

Suggested Monitoring Procedures

Teacher checks the students' written work of 2's, 5's and 10's to 100 with a test sheet.

Possible Resources

May, Lola J., _Teaching Mathematics in the Elementary School_, New York: The Free Press (Macmillan Co.), 1970, pp. 27-29

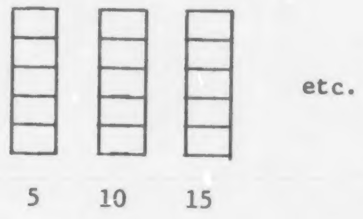
District Resources

Suggested Activities: Grade(s) 2

Title:
Group Size: students or student/small group
Materials: graph paper, scissors, pencil

Procedure:

. The student will cut the graph paper into sets of five and then record the numbers by 5's to 100.



Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to write the numerals by two's to 100.

State Goal	1, 7
District Goal	
Program Goal	5

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Write the Next "Two"
or
Write the Next Even Number

Group Size: small group/entire class

Materials: pencil and paper

Procedure:

- Student or teacher says an even number between 0 and 98.
- Other students write the next "two" or even number.

182

Suggested Monitoring Procedures

Possible Resources

District Resources

183

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to write by five's to 100.

State Goal	1, 7
District Goal	
Program Goal	5

Related Area(s)

Suggested Activities: Grade(s) 1-2

Suggested Monitoring Procedures

Possible Resources

Title: The Next Five
Group Size: small group/entire class
Materials: pencil and paper

Procedure:

- Student or teacher says a multiple of five between 0 and 95.
- Other students write the next five or multiple of five.

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student is able to write numerals by ten's to 100.

State Goal	1, 7
District Goal	
Program Goal	5

Related Area(s)

Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources
Title: The Next Ten **Group Size:** small group/entire class **Materials:** pencil and paper **Procedure:** . Student or teacher is the "caller" and says a multiple of 10 between 0 and 90. . The other students write the next ten or multiple of 10.		Sharp, F. A., *These Kids Don't Count*, Academic Therapy Publications, 1971, pp. 99-100

District Resources

190

191

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K-3

Student Learning Objective(s) The student values the ability to read and write numerals as a useful skill in daily living.

State Goal 1, 7

District Goal

Program Goal 1,3,5

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Our Numbers
Group Size: large group
Materials: none needed

Procedure:

- Discuss some ways that numbers are used in their daily life, e.g., clock, telephone, street numbers, house numbers, money, etc.
- Ask students if all the numbers were removed from these things how would they:
  - Know what time it was?
  - Dial the telephone?
  - Find streets?
  - Find homes?
  - Know how much money they have?
  - Etc.

Title: Our Numbers
Group Size: large group
Materials: newspapers for each student

Procedure:

- Have students cross out all the numbers they find in the newspaper.
- Then ask the students to read, or the teacher can read, various articles without the numbers in them. Point out how numbers are very important in gaining information.

Suggested Monitoring Procedures

Discuss problems students confront when no numbers are used. Monitor by their actions and answers to discussion questions.

Have students share ways they use numbers in reading and writing and how they would feel without them.

Possible Resources

Martin, Bill, Sounds of Mystery, Holt, Rinehart and Winston, 1967 pp. 368-371 (story: "The Day Numbers Disappeared")

Local Newspaper

District Resources

Suggested Activities: Grade(s) _______

Suggested Monitoring Procedures

Possible Resources

District Resources

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Place Value

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. the place value of ones and tens in base ten numeration.	95-	1-2					
. the place value of hundreds in base ten numeration is the third numeral from the right.	99	2-3					
. the place value of thousands in base ten numeration is the fourth numeral from the right.	101-	3-4					
The student is able to:							
. write the expanded form of any two-digit number, i.e., 34 = three tens + four ones.	95-	1-2					
. write the corresponding numeral from any two-digit number written in expanded form, i.e., three tens + four ones = 34	95-	1-2					
* . write the expanded form of any three-digit number, i.e., 342 = three hundreds + forty tens + two ones.	99	2-3					
. write the corresponding numeral from any three-digit number written in expanded form, i.e., three hundreds + four tens + two ones = 342.	99	2-3					
. write the expanded form of any four-digit number, i.e., 4,322 = four thousands + three hundreds + two tens + two ones.	101-	3-4					
. write the corresponding numeral from any four-digit number written in expanded form, i.e., four thousands + three hundreds + two tens + two ones = 4,322.	101-	3-4					
* . round numbers to the nearest ten and hundred	105	3-4					
The student values:							

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student knows the place value of ones and tens in base 10 numeration. B. The student is able to write the expanded form of any two digit numeral, e.g., 34 = 3 tens + 4 ones. C. The student is able to write the corresponding numeral from any two digit numeral written in expanded form. (3 tens + 4 ones = 34)

Related Area(s)

State Goal 1,8
District Goal
Program Goal 1,2,3

Suggested Activities: Grade(s) 1

Title: What Number Am I?
Group Size: two to twelve students
Materials: chalkboard and chalk

Procedure:

- Choose one student who stands before the group and makes a statement such as: "I am thinking of a number that is one ten and three ones. If you know what the number is, raise your hand."
- The leader then calls on a student who goes to the board and writes the numeral. If it is correct this player becomes the leader.

Extension:

- The idea of hundreds and of thousands could also be practiced using this game.

201

Suggested Monitoring Procedures

Circle the number that has 5 tens.
65 59 81 72
etc.
Record the number correct.
or
Paper and pencil test with items similar to the following:

37 = (3) tens and (7) ones
46 = (4) tens and (6) ones
and
4 tens and 7 ones = (47)
2 tens and 9 ones = (29)

Mini-Test: "Ones and Tens"
Group Size: entire class
Materials: exercise as below

Procedure:

- Complete:

What does the digit 4 mean in 49? ____________
What does the digit 9 mean in 49? ____________
What does the digit 0 mean in 60? ____________
What does the digit 6 mean in 60? ____________

Possible Resources

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel & Associates, Inc., 1973, p. 24

Let's Explore Mathematics, Arco Publishing Company, Inc., N., 1966, pp. 6-29

May, Lola J., Teaching Mathematics in the Elementary School, The Free Press, N.Y. (Macmillan Company), 1970, p. 23

Chip Trading Activity, Book 1
Place Value Chart
Cuisenaire Rods
Dienes Blocks
Bean Sticks

202

Suggested Activities: Grade(s) 1

Title: Who Am I?
Group Size: whole class
Materials: paper/pencil

Procedure:

- Teacher prepares worksheets with the following questions and gives one to each student:
- (Record in the space provided "Who I am".)

a. I'm greater than 40 and my digits are 3 and 4.
_____

b. I'm greater than 39 and my digits are 5 and 2.
_____

c. I'm less than 42 and my digits are 5 and 1.
_____

d. I'm less than 65 and my digits are 5 and 6.
_____

e. I'm less than 50 and my digits are 6 and 1.
_____

f. I'm greater than 47 and my digits are 8 and 1.
_____

Suggested Monitoring Procedures

Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 72-75

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart, Winston, 1973, pp. 129-130

District Resources

SMALL SCHOOL ROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student knows the place value of ones and tens in base 10 numeration. B. The student is able to write the expanded form of any two digit numeral, e.g., 34 = 3 tens and 4 ones. C. The student is able to write the corresponding numeral from any two digit numeral written in expanded form. (3 tens + 4 ones = 34)

Related Area(s)

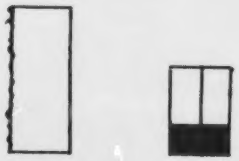
State Goal	1,8
District Goal	
Program Goal	1,2,3

Suggested Activities: Grade(s) 2

Title: Show Me The Number
Group Size: whole class
Materials: 1/2" graph paper and 12" x 18" construction paper

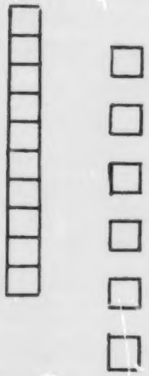
Procedure:

- Fold construction paper in half length wise, then fold up 4" from the bottom.



Cut 1/2" graph paper in groups of 10 and in individual units.

Example:



- Teacher asks: "Who can show me 3?"

Suggested Monitoring Procedures

Possible Resources

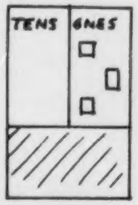
Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, N.C.T.M., 1976, pp. 143-147

District Resources

Suggested Activities: Grade(s) 2

Suggested Monitoring Procedures

Possible Resources

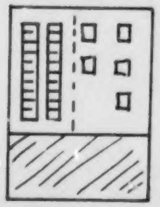


Keep asking for numbers with a single digit, then ask, "Who can show me 12?" Some students will respond with 12 ones and some will use a ten stick and two units or ones. Teacher can then talk about the differences. Keep calling numbers until the students have the idea.

Game: Show Me A Larger Number

Ask the student to show a number with the paper squares then write their number on a sheet of paper and slip under flap.

Example:



Under flap place a paper with 25 on it.

Teacher comes around, says a number and the student lifts flap and shows the teacher.

a. Divide class into two teams. Again have each student make a number, record that number and place under the flap.
b. Pass out 6 markers, counters, bottle caps or beans to each student.
c. Have one team get up and read as many numbers as they can within a certain time period. One or two minutes. Each time they name a number correctly the other students gives up a marker. The object is to read as many numbers as you can and collect as many markers as you can.
d. If a student calls out a number incorrectly that student must give up a marker.
e. Teacher calls time and the other team has a turn.
f. Winner - team with the most counters.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student knows the place value of 100's in base 10 numeration is the third numeral from the right. B. The student is able to write the expanded form of any three-digit numeral, i.e., (342 + 3 hundreds + 4 tens + 2 ones) C. The student is able to write the corresponding numeral from any three-digit number written in expanded form (3 hundreds + 4 tens + 2 ones = 342)

State Goal	1,8
District Goal	
Program Goal	1,2,5

Related Area(s) ____________

Suggested Activities: Grade(s) 2-3

Same activities expanded to include hundreds, as described for objectives related to ones and tens.

Title: What Three-Digit Number Am I?
Group Size: entire class
Materials: paper/pencil

Procedure:

. Record Who I Am.

(a) I have three digits: 2,4,6.
I am the largest number possible.__________
(b) I have three digits all the same.
I am between 250 and 400.__________
(c) I have three digits: 2,3,5.
I am egen. My tens digit is 5.__________
(d) I have three digits: 3,6,9.
I am between 550 and 700, and I have 9 in one's place.__________
(e) I have three digits. I am less than 400.
My tens digit is greater than my ones digit.
My ones digit is greater than my hundreds digit. My digits are: 5,7,3.__________

Level of Difficulty: Recommended as an activity for your "front runners" or the more able.

Suggested Monitoring Procedures

Mini-Test: "Place Value"
Group Size: entire class
Materials: written exercise as below

Procedure:
In what place is each underlined digit?

______ $23\underline{9}$ ones
______ $5\underline{6}7$ ______
______ $\underline{3}75$ ______

Possible Resources

Experiences in Mathematical Ideas, Vol. 1, National Council of Teachers of Mathematics, 1970, pp. 11-18

May, Lola J., Teaching Mathematics in the Elementary School, The Free Press (Macmillan Co.), New York, 1970, p. 27

Twin Choice 3,4,5
Dienes Block
Place Value Chart

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement 3-4

Student Learning Objective(s) A. The student knows the place value of thousands in base numeration is the fourth numeral from the right. B. The student is able to write the expanded form of any four-digit numeral, e.g., 4,322 = 4 thousands + 3 hundreds + 2 tens + 2 ones. C. The student is able to write the corresponding numeral from any four-digit number written in expanded form, e.g., 4 thousands + 3 hundreds + 2 tens + 2 ones = 4,322.

State Goal	1,8
District Goal	
Program Goal	1,2,5

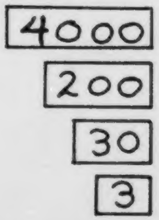
Related Area(s)

Suggested Activities: Grade(s) 3-4

Title: Expanded Notation Cards

Group Size: small group; entire class

Materials: cut a set of Expanded Notation Cards Be sure that they fit together. Place the cards together so that the longest is on the bottom up to shortest on the top. The notch on the lower right corner of each card should match. When the cards are all together, they are in their standard form.



Procedure:

- Teacher calls out a 3 or 4 digit number. Student then puts the appropriate cards together to show the number.

  Example:
- Teacher says 3,742. The student puts down 3,000, places 700 on top, then 40 on that and finishes by placing 2 on the very top. By holding the number at the notched corner, the student can display 3742. The teacher should be sure to include some numbers with zero in them, i.e,, 3402. The student would have no tens card but only 3000, 400, and 2.

213

Suggested Monitoring Procedures

Paper and pencil test with items like the following:

3567=(3) thousands + (5) hundreds + (6) tens + (7) ones

and

5 thousand + 4 hundreds + 0 tens + 3 ones = (5,403)

Circle the number that has 6 hundreds:

3762 6372 7632 3726

Possible Resources

District Resources

214

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) A. The student knows the place value of thousands in base ten numeration is the fourth numeral from the right. B. The student is able to write the expanded form of any four-digit number, i.e., 4,322 = four thousands + three hundreds + two tens + two ones. The student is able to write the corresponding numeral for any four-digit number written in expanded form, i.e., four thousands + three hundreds + two tens + two ones = 4,322.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s) ____________________

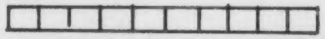
Suggested Activities: Grade(s) ______

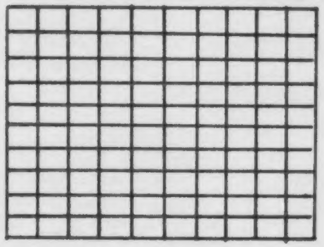
Title: Models of Four-Digit Numbers

Group Size: small groups; entire class

Materials: graph paper to show:

units of one

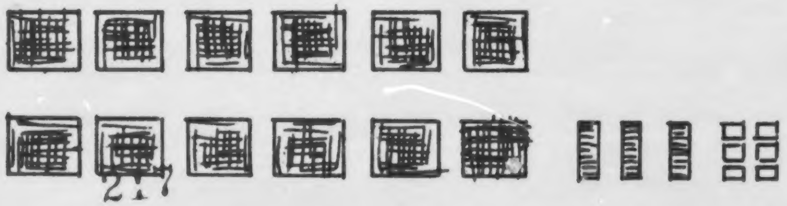
units of ten


units of 100


units of 1000 = 10 units of ten

Procedure:

- Teacher says a 4-digit number, i.e., 1,236.
- Students form various combinations of the above units to represent the number.
- Students then write the 4-digit number and write it also in expanded form, e.g., 1,236 =



Suggested Monitoring Procedures

Mini-Test: Expanded Form

Group Size: Entire class

Materials: Written exercise as below

Procedure:

Write in expanded form:

5,326 = ________ thousands + ________ hundreds + ________ tens + ________ ones

Possible Resources

Experiences in Mathematical Ideas, Volume 1, National Council of Teachers of Mathematics, 1970 pp. 19-27

Mathematics for Elementary School Teachers, NCTM, 1966, pp. 28-33

District Resources

Suggested Activities: Grade(s) ______

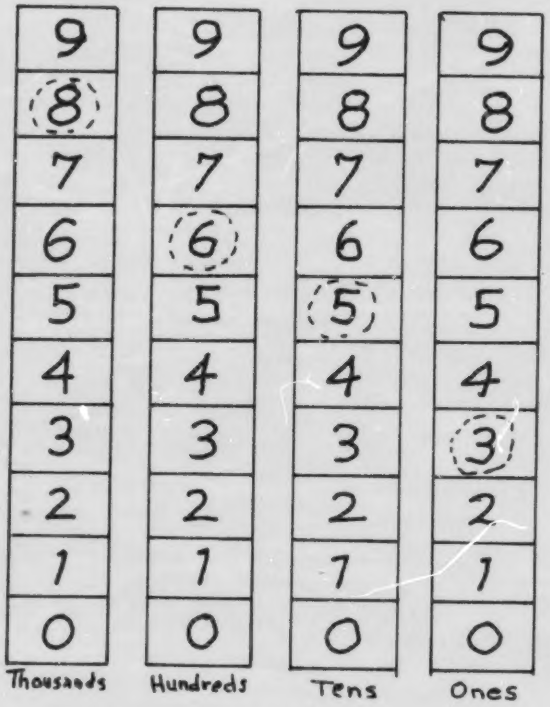
Suggested Monitoring Procedures

Possible Resources

Title: Charting 4-Digit Numbers
Group Size: Entire class
Materials: Place Value Chart (see below)
4 counters

Procedure:

- Teacher names a 4-digit number, say 8,653.
- Students place a counter on appropriate digit in each column.
- Students write the number.
- Students write number in expanded form, e.g., 8,653 = 8000 = 600 = 50 = 3



District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student is able to round numbers to the nearest ten and hundred.

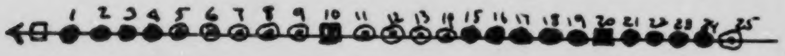
State Goal	1,8
District Goal	
Program Goal	1,2,3

Related Area(s)

Suggested Activities: Grade(s) 3-4

Title: Number Line Rounding
Class Size: partners
Materials: Adding machine tape (100"); a blade, green and red crayons, counting chips or markers

Procedure:
- Work together. Use a black crayon to draw a line from end to end.
- Add arrows, dots, and number the dots (0-100).
- Draw boxes around the dots for multiples of 10.
- Color the first box red, the second green, the third red, the fourth green, and so on.
- Draw circles around all of the other dots.
- Color them to match the box for the nearest ten.



- The teacher names a number.
- The students place a counting chip or marker on the number.
- Move the marker to the left or the right on the number line to the closer 10 in order to round to the nearest ten.
- If neither is closer move the counter to the ten on the right.

Suggested Monitoring Procedures

Mini-Test: "Rounding Numbers"
Group Size: Entire class
Materials: Exercises as below

Procedure:
- Round to nearest ten:

56 ____
21 ____
83 ____

- Round to nearest hundred:

572 ____
144 ____
776 ____

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Harper, Row & Winston, 1973, pp. 177-78.

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

224

223

SMALL SCHOOLS PROJECT

UBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Addition

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4
The student knows:							
. addition is the combining of numbers.	109	K-1					
. an addend is one of a set of numbers to be added. 4+2+3=9	111	1-3					
. a sum is the total of all addends.	111	1-3					
. that adding zero to a number does not affect the sum.	113-	1-2					
. the addition facts with sums to nine. (mastery)	117-	1-2					
. the addition facts with sum to 18. (mastery)	127-	2-3					
. that the order in which two numbers are added does not change their sum (commutative property), i.e., 3+5 = 8 or 5+3 = 8.	139-	2-3					
. when adding three or more numbers the way addends are grouped does not affect the sum (associative property), i.e., (1+2) + 4 = 1 + (2+4)	141-	1-3					
The student is able to:							
*. add two two-digit numbers without renaming (carrying), i.e., 21 + 32 = 53.	145-	1-2					
. add three or more one-digit numbers.	141	1-2					
. add two three-digit numbers without renaming (carrying), i.e., 123 + 234 = 357.	147	2					
. add three or more two-digit numbers with a sum of less than 100 without renaming (carrying), i.e., 21+23+14 = 58.	149	2-3					
*. add any numbers with two or more digits that require renaming (carrying), i.e., 26+48 = 74.	151	2-3					
. add any three or more two-digit numbers, i.e., 39+65+87+88 = 279	153	3-4					
. add any two or more three-digit numbers with renaming.	155	3-4					
*. add any two or more four-digit numbers with renaming.	155	3-4					
The student values:							

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOOLS PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) The student knows addition is the combining of numbers.

State Goal	1,7,10
District Goal	
Program Goal	

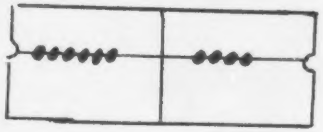
Related Area(s)

Suggested Activities: Grade(s) K-1

Title: Bead Cards

Group Size: pairs/small groups/entire class

Materials: laminated bead cards with elastic to hold the 10 beads in place for counting. Draw a line down the middle of the card for sub-sets.



Procedure:

- Students will work in pairs. One student will divide the beads into two sets, e.g., 6 and 4. The other students will count the beads in each set, e.g., 6 and 4. The student then will count them all together, i.e., 10. Now the students change jobs. The counting student now makes the sets and the set making student does the counting. They continue making as many sets as they can noting their sets always add to 10.

  Teacher asks: "How many combinations can you make?"
- Give students an opportunity to combine and determine the sum of a variety of sets of objects such as chips, students, books, sticks, etc.

Variation:

- Give students worksheets to record answers.

Suggested Monitoring Procedures

Show sets of objects. Student tells the number of objects contained in both sets.

Teacher observation.

Possible Resources

Kennedy, Leonard M., Models for Mathematics in the Elementary Schools, Wadsworth Publishing Company, Inc., 1967, Belmont, Ca., pp. 47-69

Turner, Ethel M., Teaching Aids for Elementary Mathematics, Holt, Rinehart and Winston, Inc., 1966, New York, p. 5

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 83

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood Education, NCTM, 1976, p. 167

Bead Fact Finder

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) A. An addend is one of a set of numbers to be added. B. A sum is the total of all addends.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 1-3

Suggested Monitoring Procedures

Possible Resources

Title: Number Sentence Vocabulary (Addition)
Group Size: entire class
Materials: paper, pencil, counters,
word names on tagboard
for: addend (2 cards)
sum
symbols on tagboard
for: "+" and "="

Procedure:

- Teacher and students form a physical model for 3+2=5 with counters.
- Teacher and students write the number sentence for the model.
- Teacher and students read the number sentence together "Three plus two equals five."
- One student places the word name for addend on the chalkrail beneath "3".
- Another student places the card for + between the two numbers.
- Another student places the word name addend beneath the number "2".
- Another student places the symbol card = in position.
- Finally another student places the word name sum below the number "5".

Note: An addend is defined as one of a set of numbers to be added.

Thus:
□□□   □□
3 + 2 = 5
addend + addend = sum

Baratta-Lorton, Mary, Mathematics Their Way, Addision-Wesley, 1976, pp. 219-220

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, p. 149

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ;-2

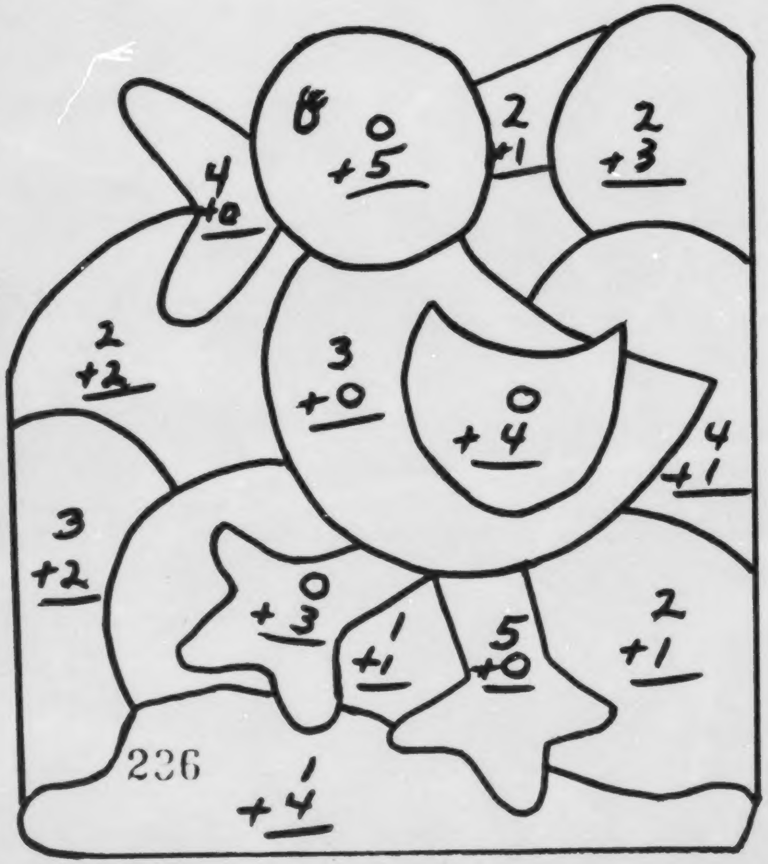
Student Learning Objective(s) The student knows that adding zero to a number does not affect the sum.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Can We Handle Zero?
Group Size: individual or entire class
Materials: worksheet and crayons



Suggested Monitoring Procedures

Oral questioning
Paper and pencil test

Mini-Test: "Adding Zero"
Group Size: entire class
Materials: exercise such as example below

Procedure:

. Ask the students to circle problems where the sum is the same as the larger of the two addends.

Example:

2	3	0	1	6
+0	+4	+8	+2	+1

Possible Resources

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 87-88

District Resources

Suggested Activities: Grade(s) 1

Procedure:

- Students are asked to add all problems, recording the sums. Then they are to color all the problems that have a zero in the equation.
- Ask the student what happens to the sum when zero is one of the addends.

Note: See diagram.

Title:
Group Size: small group
Materials: 10 styrofoam cups, 15 counters paper and pencil

Procedure:

- Set up five stations in different parts of the room.
- At each station there are two cups, paper and pencil.
- At each station place one to five counters in the first cup and none in the second.
- Directions to students:
  - (a) Go to each station and count the number of counters in each cup.
  - (b) Determine the number of objects there will be when the counters in the two cups are joined in one cup.
  - (c) Write the addition fact involving zero to describe what has taken place in the activity with the cups.

$$\boxed{2+0=2}$$

Suggested Monitoring Procedures

Oral questioning
Paper, pencil worksheet

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows that adding zero to a number does not affect the sum.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Concentration
Group Size: 2 or 3 players
Materials: two sets of cards. One set with equations where zero is added to a number 20 or less (example: $\boxed{20+0}$, $\boxed{15+0}$). One set of cards will be the corresponding answer cards to the equation cards, (example: $\boxed{20}$ $\boxed{15}$

Procedure:

- Shuffle both sets of cards together. Lay all the cards face down in 5 or 6 rows. In turn, each player turns 2 cards face up. If they match, the student keeps the pair and takes another turn. If the cards do not match, they are placed face down in their former positions. The next player takes a turn, following the same procedure. The player having the most cards when all the cards have been matched, wins the game.

Suggested Monitoring Procedures

Paper-pencil test
Student gives verbal response to flash cards

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, p. 147

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

242

243

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows the addition facts with sums to nine (mastery).

State Goal 1,7,10

District Goal

Program Goal

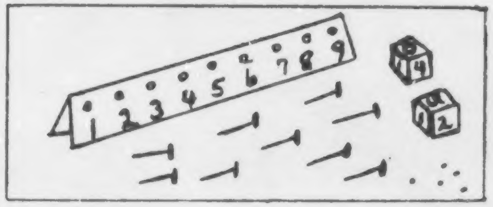
Related Area(s)

Suggested Activities: Grade(s) 1

Title: Nine Holes

Group Size: pairs of students

Materials: 2 tagboard strips with 9 holes, 2 cubes, one cube marked with numbers 0-5 and another cube marked with numbers 0-4 plus an extra 0. 9 golf tees for each student (18 total)



Procedure:

. Teacher directs as follows:

(a) First player rolls the dice.

(b) Player adds the addends and says the equation aloud (e.g., "Zero plus five equals five.").

(c) Player then puts a golf tee in the hole representing that sum (5).

(d) The next player takes a turn, following the same procedure.

(e) The first player to fill all 9 holes with golf tees wins the game.

(f) When there are only 2 or 3 holes left to

Suggested Monitoring Procedures

Student often uses manipulative aids or other aids.

Mastery of addition facts with sums to nine implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 6+3?" or if shown $\boxed{\begin{array}{r}6\\+3\end{array}}$ or $\boxed{6+3}$ in written form, the student responds instantly from memory. Check one student at a time.

Possible Resources

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 91-93

District Resources

Suggested Activities: Grade(s) 1

fill, and a player does not get the needed combination, next player takes one turn.

Note: Golf tees fit best if put through only one hole or piece of tagboard, rather than two.

Title: Rocks, Paper, Scissors
Group Size: pairs of students
Materials: four fists (see diagram)

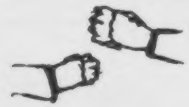


Diagram 1

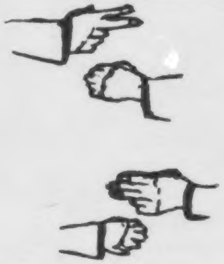


Diagram 2

Procedure:

- Teacher demonstrates to students the positions for rock, paper, scissors.
- Teacher then gives the following directions:
  - (a) Students pound their fists together 3 times. On the third time, they each thrust out as many fingers as they want (up to 5).
  - (b) Each student then adds the two sets of fingers together (adding both students' fingers).
  - (c) The first student to call out the correct answer gets a point. The one with the most points wins.
  - (d) Teacher can set a time limit of 10 minutes.

Suggested Monitoring Procedures

Possible Resources

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 31

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows the addition facts with sums to nine. (mastery)

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Match Boxes
Group Size: individual
Materials: flat box (nylon stocking box), cardboard or tagboard to be cut into pieces to match the regions on the inside of the box lid, colorful picture to glue on the back of the cardboard or tagboard.

Procedure:

. Making the match box:
  (a) Cut tagboard to fit inside of box lid. (Make length and width 1/4" smaller than the box lid.)
  (b) Glue picture to the tagboard with rubber cement.
  (c) Rule inside of the box lid into rectangles of the same size. (Three rows of four regions each works well.)
  (d) Rule the tagboard (not the picture side) into rectangles that match those of the box lid.
  (e) Write problems and answers on a piece of paper, making sure that no problem or answer is repeated. Write the problems on the inside of the box lid, and the corresponding answers on the matching rectangles on the tagboard.
  (f) Cut out the tagboard rectangles.

Suggested Monitoring Procedures

Paper, pencil test
Student answers flashcards

Possible Resources

Kennedy, Leonard M., Models for Mathematics in the Elementary School, Wadsworth Publishing Co., 1967, pp. 62-70

District Resources

Suggested Activities: Grade(s) 2

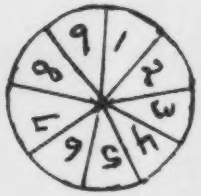
Suggested Monitoring Procedures

Possible Resources

- Instructions for use:
  - (a) Place answer pieces on the matching problem regions on the inside of the box lid.
  - (b) Put the bottom of the box inside the lid. Press down firmly and turn the box and lid over. If each piece has been put in the correct place, the picture will have been put together and can be seen by removing the lid.

Title: Speedo - (Game)
Group Size: large group
Materials: spinning wheel marked 0 to 9, equation cards without answers:

3+5=



(Make cards for every possible addition with sums 9 or less) (If equation cards are 1"x3", they can all fit into a cottage cheese carton, and the spinner wheel can be made on the lid for a completely stored game.)

Procedure:

- Leader gives each student four equation cards. Students lay them on their desks and study them.
- The leader spins the spinner and calls out the number. Any student who has an equation card whose sum is that number, calls out "Speedo". The first person to call out gets to read his/her equation card. If it makes a true equation, he/she gets to turn that equation card face down. (If the equation card does not match the number called out, the student does not turn over the equation card and if he/she has any cards turned over from previous turns, he/she must turn one back up.)

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows the addition facts with sums to nine. (mastery)

State Goal 1,7,10

District Goal

Program Goal

Related Area(s)

Suggested Activities: Grade(s) 2

Suggested Monitoring Procedures

Possible Resources

- The game continues until a student has turned over all four cards. That student wins and becomes the next "leader".

Variation:

- Make equation cards with:
  - (a) Sums to 18.
  - (b) Subtraction facts 9 or less.
  - (c) Subtraction facts with sums 18 or less.

District Resources

252

253

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows the addition facts with sums to nine. (mastery)

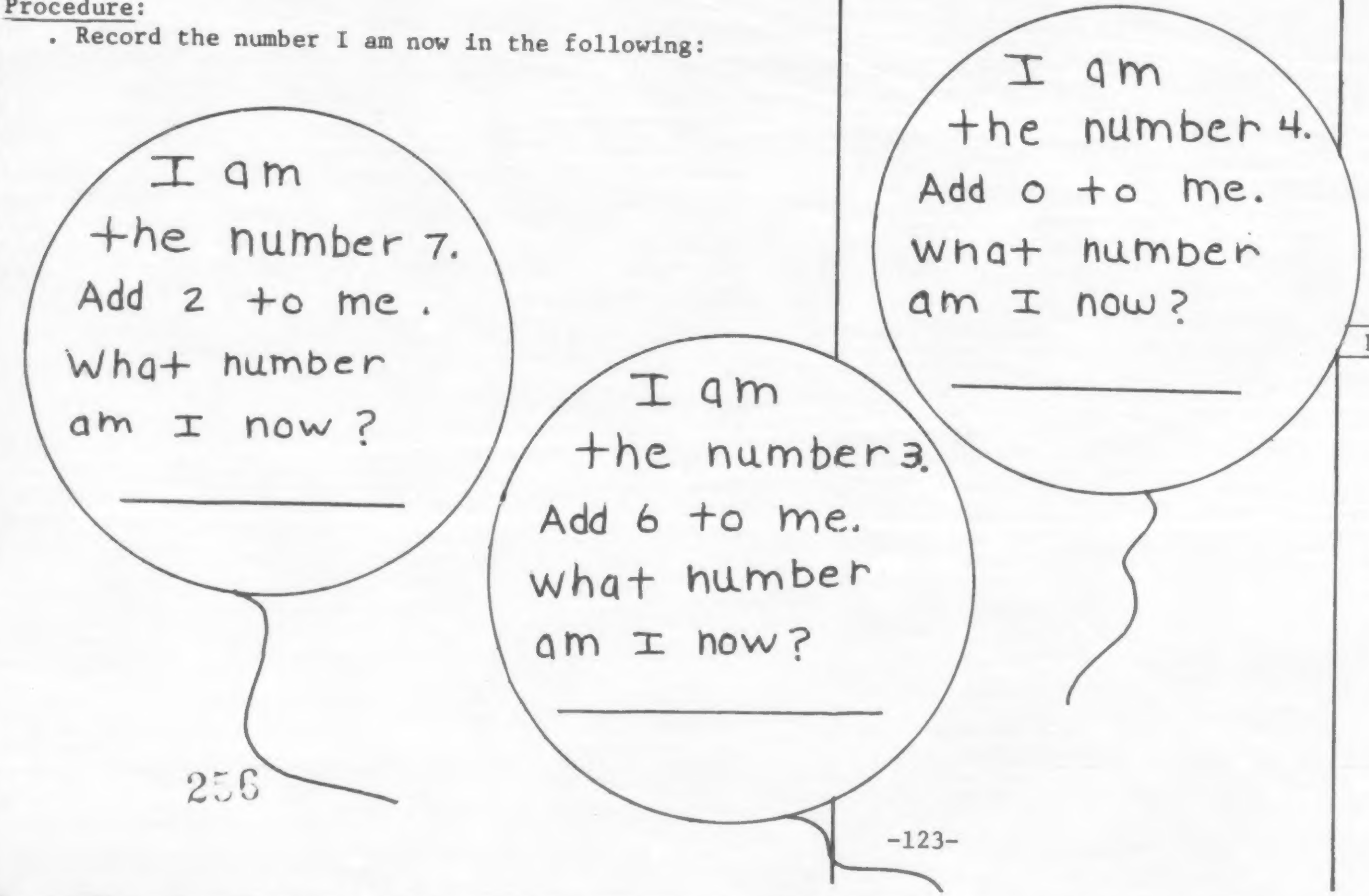
State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Title: What Number Am I Now? **Group Size:** whole class **Materials:** paper-pencil	Paper-pencil test Student answers flash cards	

Procedure:

- Record the number I am now in the following:


I am the number 7. Add 2 to me. What number am I now? ____
I am the number 3. Add 6 to me. What number am I now? ____
I am the number 4. Add 0 to me. What number am I now? ____

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS OJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows the addition facts with sums to nine. (mastery)

State Goal	1,7,10
District Goal	
Program Goal	

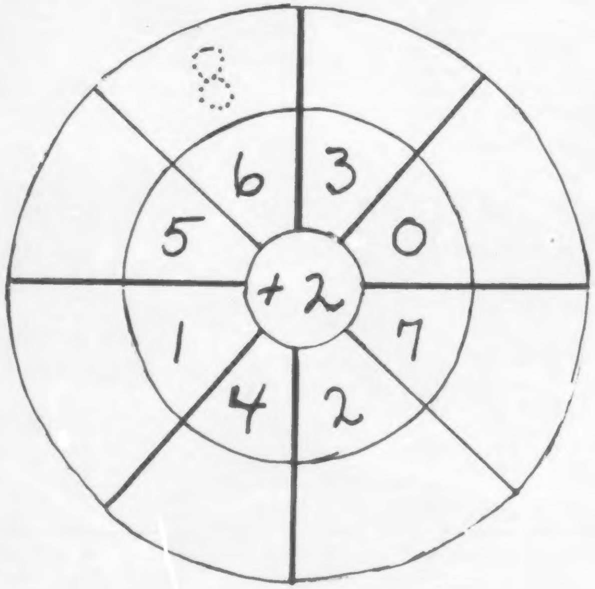
Related Area(s)

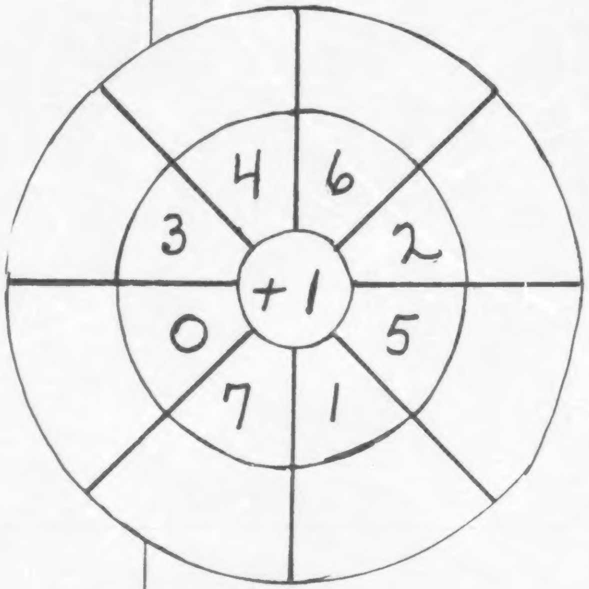
Suggested Activities: Grade(s) 2

Title: Round-n-Round
Group Size: entire class
Materials: paper-pencil

Procedure:

. Give the missing number in each spoke of the wheel:





Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement 2-3

Student Learning Objective(s) The student knows the addition facts with sums to 18. (mastery)

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Bean Bag Toss
Group Size: partners
Materials: two bean bags, large chart (to be placed on the floor)
Sample:

9	8	3
7	6	2
5	4	1
0		

Procedure:

- Throw two bean bags onto the chart.
- Add the two numbers shown in the squares in which the bean bags land.
- The player with the higher score wins one point.
- The first to score 10 points wins the game.

Suggested Monitoring Procedures

Mastery of addition facts with sums to 18 implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 6+7?" or if shown $\boxed{\begin{array}{r}6\\+7\end{array}}$ or $\boxed{7+6}$ in written form, the student responds instantly from memory. Check one student at a time.

Possible Resources

Pagne, Joseph N., Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 178-180

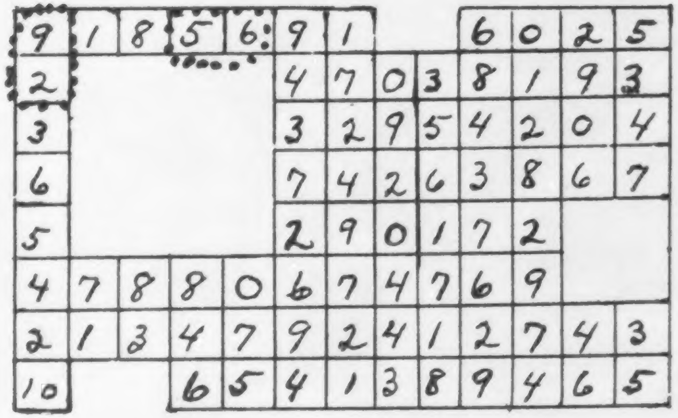
Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 150-156

District Resources

Suggested Activities: Grade(s) 2-3

Title: Circle Sums
Group Size: entire class
Materials: paper/pencil

Procedure:
- . Circle adjacent squares that add to a particular sum, e.g., 11. (Adjacent swuares are squares that have a common side.)
- . Note the horizontal and vertical examples.



9	1	8	5	6	9	1			6	0	2	5
2					4	7	0	3	8	1	9	3
3					3	2	9	5	4	2	0	4
6					7	4	2	6	3	8	6	7
5					2	9	0	1	7	2		
4	7	8	8	0	6	7	4	7	6	9		
2	1	3	4	7	9	2	4	1	2	7	4	3
10			6	5	4	1	3	8	9	4	6	5

Suggested Monitoring Procedures

Student answers flash card
Paper/pencil test

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student knows the addition facts with sums to 18. (mastery)

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

Title: Thinking
Group Size: entire class
Materials: paper/pencil

Procedure:

- Examine the one example that is given.
- Now think about what is required and complete the six tables.

11

6	5
9	
4	
3	

12

13

4	
5	
7	
9	

14

15

7	
9	
3	
8	

16

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources

Title: Complete the Sentences
Group Size: entire class
Materials: paper/pencil

Procedure:

(a) □ ○ = 2 different numerals

□ □ = same numerals

(b) Complete the number sentences by writing the missing numerals in the frames:

○ + □ = 13	□ + □ = 14
○ + □ = 13	○ + □ = 14
○ + □ = 13	○ + □ = 14
○ + □ = 15	□ + ○ = 16
○ + □ = 15	□ + ○ = 16
○ + □ = 15	□ + □ = 16

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student knows the addition facts with sums to 18. (mastery)

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

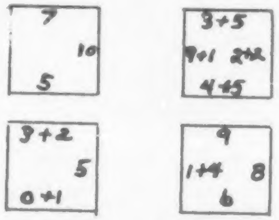
Suggested Activities: Grade(s) 3

Title:
Group Size: individual
Materials: ditto copy of cut away worksheet or tagboard cut up in squares, scissors (if worksheet is used)

Procedure:

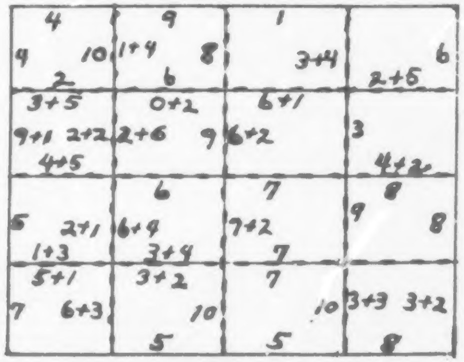
- Cut out the squares. Fit them together so that the edges that touch name the same numbers.

Example:


7
10
5
3+5
9+1 2+2
4+5
3+2
5
0+1
9
1+4 8
6

Variation:

- Match other cards to all sides of original card. Diagram of cut-away worksheet:


4
9 10
2
9
1+4 8
6
1
3+4
6
2+5
3+5
9+1 2+2
4+5
0+2
2+6 9
6+1
6+2
3
4+2
5 2+1
1+3
6
6+4
3+4
7
7+2
7
8
9 8
5+1
7 6+3
3+2
10
5
7
10
5
3+3 3+2
8

Suggested Monitoring Procedures

Teacher uses flash cards to check facts.

Teacher observes student in math activity.

Paper and pencil test of math facts with sums to 18.

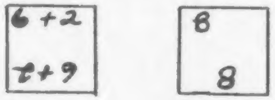
Possible Resources

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, pp. 33-34

District Resources

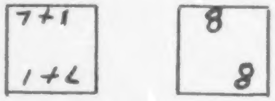
Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title: Solitary
Group Size: individual
Materials: cards with addition facts to 18 and sums to correspond to the facts. Include ten, twenty, or twenty-five facts.
Example: Cards 3"x2"



Procedure:

- Shuffle the cards.
- Place them face down on the table in a pile.
- Turn up one card at a time, placing it face up on the table, not in a pile.
- When a fact and a sum match place them in a separate pile face up.



- Continue until all the cards have been matched.

Title: Search 'n Circle
Group Size: individual
Materials: worksheet of Search 'n Circle

Procedure:

- Give copies of this number puzzle to students.
- Ask them to follow the written directions. (See below.)

Written directions:
Circle 10 addition equations.

Variation:
Circle 10 subtraction equations. Can you find more?

Example:

$$\begin{array}{r}2\\ \underline{7}\\ 9\end{array}$$

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

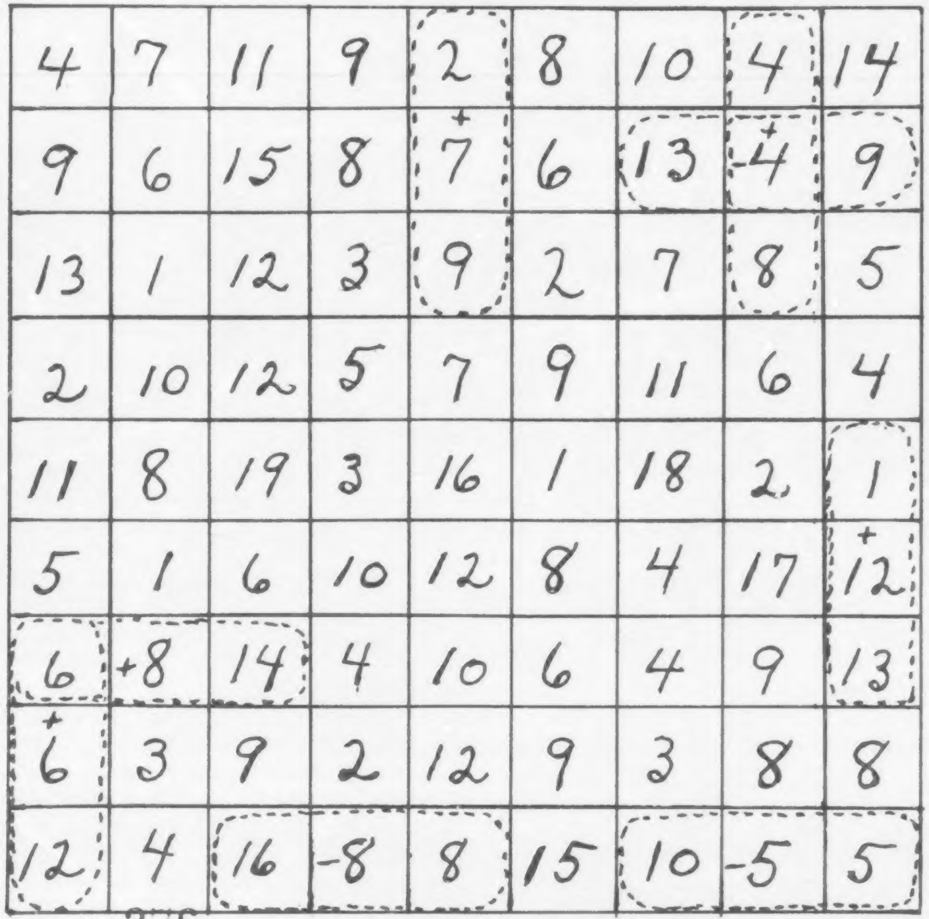
Student Learning Objective(s) The student knows the addition facts with sums to 18.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3

Diagram of Search 'n Circle game:



4	7	11	9	2	8	10	4	14
9	6	15	8	$\overset{+}{7}$	6	13	$\overset{+}{-4}$	9
13	1	12	3	9	2	7	8	5
2	10	12	5	7	9	11	6	4
11	8	19	3	16	1	18	2	1
5	1	6	10	12	8	4	17	$\overset{+}{12}$
6	+8	14	4	10	6	4	9	13
$\overset{+}{6}$	3	9	2	12	9	3	8	8
12	4	16	-8	8	15	10	-5	5

Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Activities: Grade(s) 3

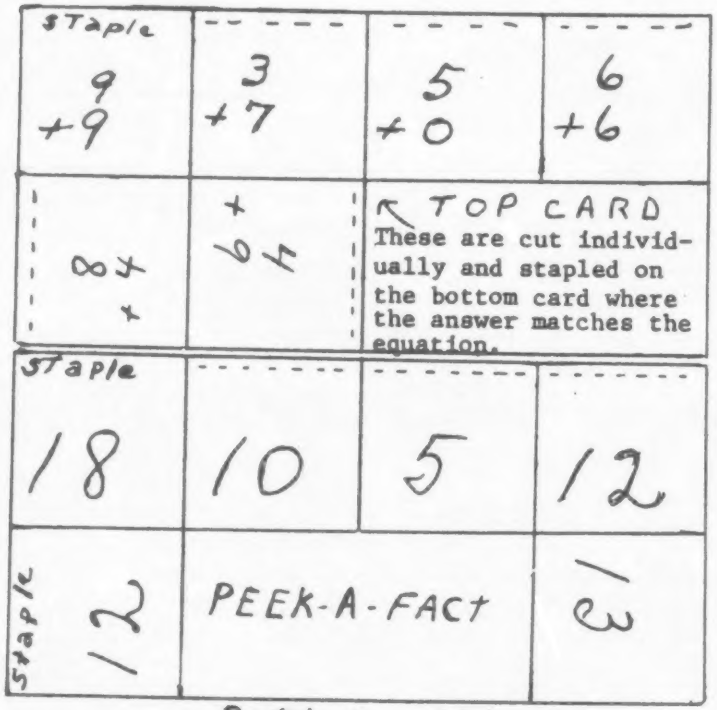
Suggested Monitoring Procedures

Possible Resources

Title: Peek-A-Fact

Group Size: individual

Materials: These cards are made by the teacher: Two 3"x6" tagboard cards divided into squares 1½"x1½". Staple the addition equation on the corresponding answers.



Staple
9 +9
3 +7
5 +0
6 +6
8 +4
9 +4
TOP CARD
Staple
18
10
5
12
Staple
12
PEEK-A-FACT
13

These are cut individually and stapled on the bottom card where the answer matches the equation.

Bottom CARD

Procedure:

- The student reads the number fact that is on the top of the card, e.g., (9+9). Then they determine what they think is the answer and check themselves by lifting up the card and find the correct answer.

District Resources

SMALL SCHOO[illegible]ROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student knows the addition facts with sums to 18. (mastery)

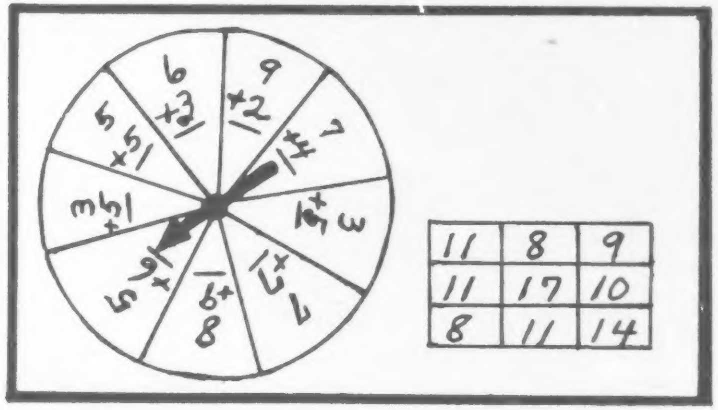
State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3

Variation:
- Write the number fact, say 9x9, and then the answer you think it is, say 18. Then peek to see if you are right.
- Counters can be used if needed.

Title: Spin-A-Sum
Group Size: pairs
Materials: 9x12 sheets that look like the following. These should be laminated or covered with contact paper, crayon.



11	8	9
11	17	10
8	11	14

Procedure:
- Each student needs a sheet like the above and a crayon. In turn, the students spin their own spinner and determine the difference. They then

Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Activities: Grade(s) 3

Suggested Monitoring Procedures

Possible Resources

mark the answer with an "x" on the 3x3 grid (e.g., the spinner points to +4. The answer, 11, is marked with an "x" on the grid only once. The next player follows the same procedure on their own 9x12 sheet. The first player to get 3 in a row wins. Up and down, across, etc. When they are finished, the student wipes the sheet off with a paper tissue for the next player.

11	8	9
11	17	10
8	~~11~~	14

Note: See following page for directions on how to make a spinner.

District Resources

DIRECTIONS
CONSTRUCTING SPINNERS

Of the several ways that spinners may be constructed, the method described below is one of the simplest.

Materials needed:
- spinner dial(s)
- chipboard on which to mount spinner dial(s)
- clear self-stick plastic
- spinner arrow(s) - ticket board or plastic
- No. 4 (1 inch) brass fastener(s)
- small washer(s)
- plastic drinking straw
- glue
- masking tape

Step 1 - Cut spinner dial to fit chipboard or vice versa.

Step 2 - Attach spinner dial to chipboard.

Step 3 - Cover spinner dial with clear self-stick plastic: overlap, fold over, and secure plastic to underside of chipboard (cut off the excess plastic at each corner so that it will fold neatly without "bunching" up).

Step 4 - Make a small slit at the center of each spinner dial with a pointed Exacto blade. (Do not make the slit any larger than needed in order to be able to force through a brass fastener -- see Step 9.)

Step 5 - Cut a 5mm length of plastic drinking straw for each spinner.

Step 6 - Make a small washer from ticket board for each spinner if you do not have a metal washer. (Just punch a quarter-inch hole and trim to a hexagonal shape.)

Step 7 - Make a spinner arrow from ticket board or plastic for each spinner: the arrow should be about one-half inch wide and from two to two and a half inches long. The hole should be punched as nearly in the middle as possible.

Step 8 - Put the piece of straw, arrow and washer on the brass fastener: make sure that the straw is inside the washer and arrow holes and that the arrow is nearest the head of the fastener.

Step 9 - Push the fastener through the slot in the spinner board, bend the fastener prongs flat against the chipboard and use masking tape to hold them in this position.

If assembled correctly, the small piece of drinking straw will hold the head of the fastener away from the spinner dial and the washer will keep the arrow from rubbing on the dial, allowing it to rotate freely.

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) The student knows that the order in which two numbers are added does not change their sum. (commutative property) e.g., 3+5 = 8, or 5+3 = 8.

State Goal 1,7,10

District Goal

Program Goal

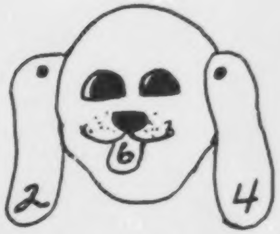
Related Area(s)

Suggested Activities: Grade(s) 2

Title:	Fido Facts
Group Size:	individual or small group
Materials:	11 heavy duty paper plates (small size 20 brads (brass fasteners) brown railroad board 1 9x12 red construction paper glue or rubber cement Teacher makes 20 dog ears from brown cardboard and 10 dog faces (on plates) On each ear write a numeral 0-9. (There will be 2 ears for each number.) On the dog's red tongue write a number 0-11.

Procedure:

- Students choose a plate, look at the number on the tongue, and find two ears whose sum equal that number. Fasten ears to dog with brads.



The students will see that the sum will remain the same no matter which side of the dog either ear is placed. They will also find that there are various combinations of numbers making one sum.

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Suggested Monitoring Procedures

Individual students can show teacher commutative property using counters and recording on paper using equations.

Possible Resources

D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 85-87

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 181-182

Kelley S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 36

District Resources

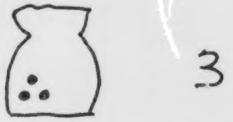
Suggested Activities: Grade(s) 2

Title: Pebbles In A Bag
Group Size: small group or whole class
Materials: paper bag, pebbles

Procedure:

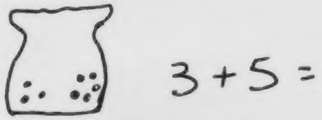
- Have a student put several pebbles in a bag as the class observes. (Class watches, hears, pebbles drop, and participant feels pebble.) Record the number of pebbles on the board.

1.



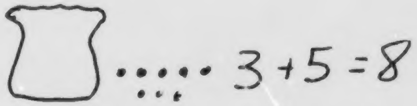
- Have another student add more pebbles to the bag. Write the number sentence on the board.

2.



- Class guesses how many pebbles are in the bag. A student can then remove all the pebbles from the bag and answer the equation.

3.



- Leave the equation on the board, going through steps 1 through 3 again, only reversing the equation to read 5+3=8.
- Have the students "make a rule" about the two equations. (Elicit the law of commutativity.)

Suggested Monitoring Procedures

Student demonstrates commutativity using objects and recording number sentence.

Possible Resources

Marks, John L., Teaching Elementary School Mathematics for Understanding, McGraw-Hill, 1965, p. 154

E.S.D. 109

Film: F-1887a "Commutativity"

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) A. The student knows that when adding three or more numbers the way addends are grouped does not affect the sum, associative property, e.g., (1+2)+4 = 1+(2+4). B. The student is able to add three or more one-digit numbers.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Trains
Group Size: 4
Materials: 2"x3" cards with numerals 0-4 on the cards

0 1 2 3 4

Procedure:

- Three students stand one behind the other, each holding a numeral card. The "conductor" looks at each card and adds orally "2+3=5 and 5+1=6". Then, the "conductor" begins adding the numbers in reverse order, "1+3=4, 4+2=6". If the two sums do not agree, and the "conductor" is wrong, the "conductor" is fired and a new "conductor" takes over. If the "conductor" is right, the "conductor" gets to add again. The "train" picks new or different numbers for the "conductor" to add.

Title: Cops and Robbers
Group Size: pairs
Materials: two sets of cards: one with two facts together, e.g., 3+1 2+3 0+2, etc. One with a single numberal on it, e.g., 4 5 2, etc.

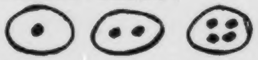
Procedure:

- The "robber" holds two cards, 2+2 and 2 for example. When the "cop" says "Hands up" the "robber" holds the cards up. If the "cop" cannot name the sum correctly, the "robber" escapes.

Suggested Monitoring Procedures

Mini-Test "Grouping Property of Addition"
Group Size: one student
Materials: 10 or more counters
Procedure:

- Ask the student to create a physical model of the problem 1+2+4 with counters.
- Student shows:



- Ask student to group counters (1+2)+4, then 1+2(2+4) and compare results.
- Are their sums the same?
- What do you conclude:

Possible Resources

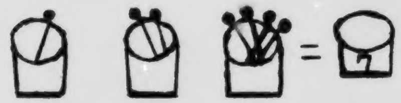
D'Augustine, Charles H., Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1976, pp. 88-90

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, 1973, pp. 37-38

District Resources

Suggested Activities: Grade(s) 1

Title:
Group Size: individual, entire class
Materials: containers such as dixie cups or paper plates or pie plates with numerals on them (1+9); counters, beans or paper straws



Procedure:

- Students are given straws in a cup with the number of straws labeled on the cup. Students are also given three empty cups in which they rearranged the straws into three different groupings using all the straws. The students record their findings with paper and pencil.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) A. The student knows that when adding three or more numbers the way addends are grouped does not affect the sum (associative property) (13+12)+14 = 14+(13+12).

B. The student is able to add three or more one-digit numbers.

Related Area(s)

State Goal	1,7,10
District Goal	
Program Goal	

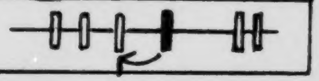
Suggested Activities: Grade(s) 2-3

Title: Group-A-Pin
Group Size: entire class
Materials: cord or rope for clothesline or edge of box and set of clothespins of 3 different colors.

Procedure:

- Snap groups of the colored clothespins onto the clothesline or box edge.
- e.g., 3 red, 1 yellow, and 2 green clothespins.
- Ask how many clothespins altogether.
- Then slide middle groups next to the first group, How many? 3+1+4.
- Then add the total to the last group (2) to get 6.
- You can write the equations on the chalkboard:

(3+1) + 2 = 6



- Then regroup the clothespins, placing the middle pin with the last group, etc.

Suggested Monitoring Procedures

Paper and pencil test.
Teacher observes students in an activity.

Possible Resources

Pagne, Joseph N., Mathematics Learning in Early Childhood, National Council of Teachers of of Mathematics, 1976, p. 173

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 168-170

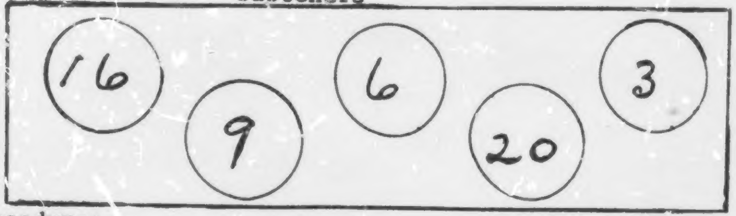
District Resources

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

Title: Target Practice
Group Size: small groups or pairs
Materials: 75 by 90 cm tagboard, 5 aluminum foil pie pans and brass paper fasteners



Procedure:

- Make a target - practice board by fastening five aluminum-foil pie pans to the tagboard with paper fasteners.
- For scoring, paint numerals as shown (or with your own variation of) numbers.
- Lay the tagboard on the floor and mark a throwing line 1.5 meters from it.
- Let each student throw three bean bags.
- The student then totals the points scored.
- The student with the highest sum gets a point.
- The first student to get 10 points is the winner.

District Resources

SMALL SCHOO PROJECT

Suggested Objective Placement 1

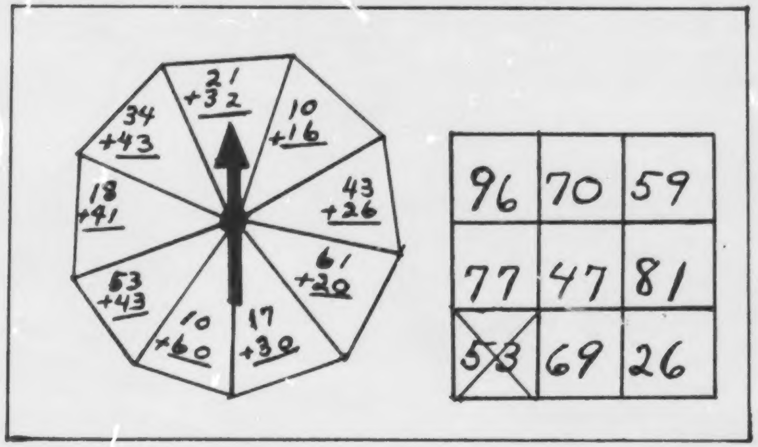
Student Learning Objective(s) The student is able to add two two-digit numbers without renaming (carrying), e.g., 21+32 = 53.

State Goal	1.7.10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Spin-A-Sum
Group Size: pairs of students
Materials: 9"x12" tagboard worksheets laminated or covered with clear contact paper, two different colored crayons and cleaning rag, spinner with addition problems.



Procedure:

. Teacher gives each student a sheet and crayon, and the following directions:

(a) Each student takes turns spinning the spinner and determines the sum.

Suggested Monitoring Procedures

Teacher checks worksheet with addition of two 2-digit numbers

Possible Resources

May, Lola J., Teaching Mathematics in the Elementary School, The Free Press (Macmillan Co.), New York, 1970, pp. 69-74

District Resources

Suggested Activities: Grade(s) 1

(b) The student then marks the answer with an "x" on the 3X3 grid (e.g., spinner points to 43 and the answer is 69.
+26
Student puts an "x" on 69 (only once).

(c) The next student follows the same procedure on his/her own sheet.

(d) The first student to get 3 "x's" in a row wins.

(e) When the game is over, students wipe the sheets off with a tissue or rag.

(f) Students should check each other for the correct answers.

Title:	Beansticks
Group Size:	small or large group
Materials:	beansticks and individual beans (beansticks: paste 10 beans on a tongue depressor); paper plates (white and colored)

Procedure:

- Teacher gives each student three paper plates (one should be a different color), and a supply of beansticks and loose beans.
- Teacher gives students addition problems to solve involving two-digit numbers (e.g., 23
  +41
  The beansticks represent units of ten and the loose beans units of one.
- Teacher directs students to place the beansticks necessary to add up to the first addend (23 would require two beansticks and 3 single beans) in one plate. The student then places 4 beansticks and one single bean in another plate (41). On the third or colored plate, student joints the two sets and finds the total is 6 tens and 4 ones, or 64.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) The student is able to add two 3-digit numbers without renaming (carrying), e.g., 123 + 234 = 357.

State Goal 1,7,10

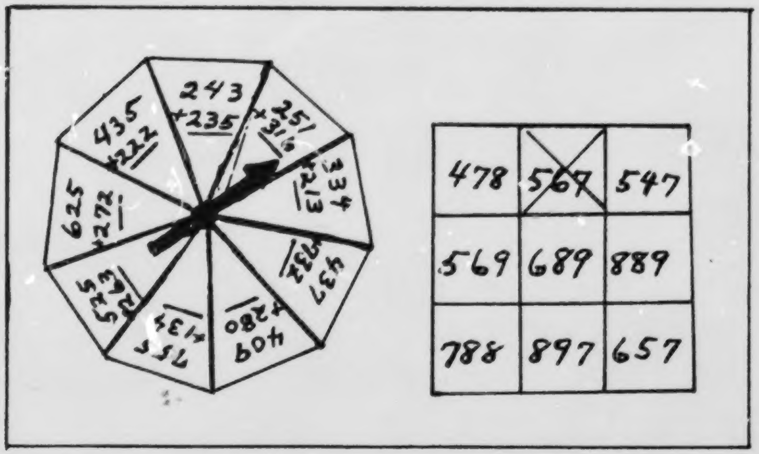
District Goal

Program Goal

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Spin The Answer
Group Size: pairs of students
Materials: 8½"x11" card with spinner and tic-tac-toe grid with the answer to the problems on the spinner. (Mount on colored paper 9"x12" and laminate.) markers



Directions: The pairs of students play against each other. Each student has a playing card. Player A spins spinner to a problem, then places a marker on the answer to the problem on the board. Player B follows the same procedure, placing a marker on his own tic-tac-toe chart. The first player to have three markers in a row on a card wins.

Suggested Monitoring Procedures

Paper/pencil test.

Possible Resources

Kennedy, Leonard M., Models for Mathematics in the Elementary School, Wadsworth Publishing Co., Inc., Belmont, Calif., 1967, pp. 60-62

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources
303		304

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

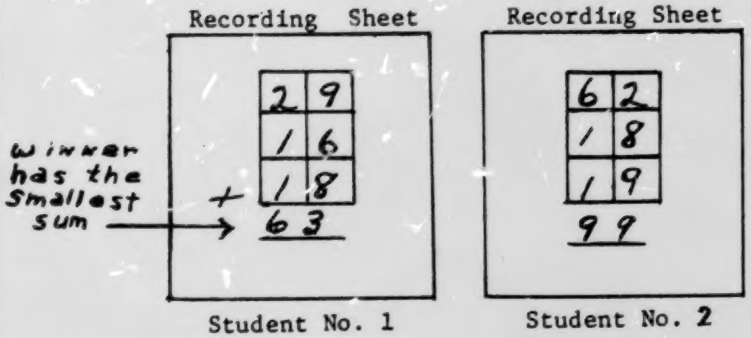
Student Learning Objective(s) The student is able to add three or more 2-digit numbers with a sum of less than 100 without renaming (carrying), e.g., 21 + 23 + 14 = 58.

State Goal	1
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources

Title:
Group Size: small group of 2-3 students
Materials: 3"x4" cards numbered 0-9, a box to hold the cards, a dittoed recording sheet for each student.
Example:



Procedure:
- Put the mixed number cards in the box.
- One student picks a card with a number on it and the other students write that digit in any square on their record sheet.
- Put that number card back on the table. (You may put it back in the box if you wish.)
- Continue to draw numbers until all blanks are filled.
- When all blanks are filled, add up the addends.
- The winner is:
  (a) The player who builds the least sum, or
  (b) The player who builds the largest sum.

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 164-167

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

307

308

SMALL SCHOOL PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student is able to add any numbers with two or more digits that require renaming (carrying), e.g., 26 + 48 = 74.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3

Title: Shopping

Group Size:

Materials: catalogs: Sear's catalog, seed catalog, toy catalog, discount store catalog, book catalog, camping goods catalog, appliance catalog, automotive parts catalog, sporting goods catalog, etc.

Procedure:

- Using 3X5 cards, write a series of tasks requiring students to locate items, write amounts, and add numbers in order to solve problems.

  Example:

Bicycle	59.95
Bookcase	34.50
Total	

← price of each

- Have a sheet on which students can compute and share their answers.
- Students can make a poster advertising the product they choose as the best buy, or
- Show students how to make books containing one coupon for each item they decide to buy.

  Note: If the cards were laminated, the student could solve the problem on the cards.

Suggested Monitoring Procedures

Possible Resources

Experiences in Mathematical Ideas: Volume 1, National Council of Teachers of Mathematics, pp. 56-61

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOO PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student is able to add any three or more 2-digit numbers, e.g., 39 + 65 + 87 + 88 = 279.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

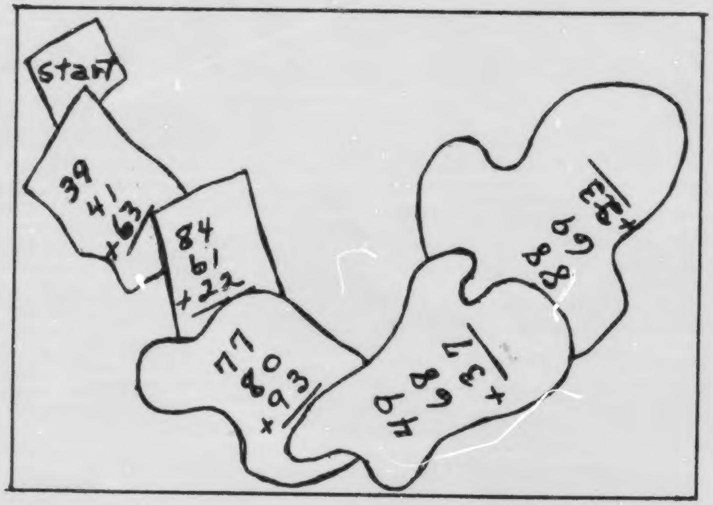
Suggested Activities: Grade(s) 3-4

Title: Patchwork Snake
Group Size: two or three
Materials: fabric, pins, glue, plastic lamination and needles.

Procedure:

- Have the students sew together scraps of fabric, each about a foot in length, to make a long walk on "Snake".

  Example:



- On each section pin or write a proble (these could be laminated and glued on so the student may write on them).

Suggested Monitoring Procedures

Paper/pencil test

Observe the student in an activity.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, p. 171

District Resources

Suggested Activities: Grade(s) 3-4

Suggested Monitoring Procedures

Possible Resources

- To play the game, all players begin at start. A non-playing official will hold the answer sheet to check the answers.
- Player throws the dice and moves the number of patches indicated.
- The player must work the problem on which he or she lands and call out the answer.
- If the player does not have the correct answer the player must go back to the starting point.
- The first player to reach the finish is the winner.

Title: Newspaper Idea
Group Size: individual or small group
Materials: newspapers, scissors, paste, pencil and paper

Procedure:

- Give students a list of groceries needed for dinner. Have the students locate the advertised price of the items in the newspaper. Then, have them cut and paste their grocery list with the prices to a plan sheet of newsprint. Last, have the students total the price of the items listed.

Title: Weigh-In
Group Size: small group
Materials: bathroom scale, paper and pencil

Procedure:

- Have the students weigh themselves on the scale and record their weight. Then have the students determine the total weight of the group by adding all the individual weights.
- Extension: Have students compare their total group weight to the weight of a car, truck, refrigerator, water bed, etc. This will force the students to research (ask questions of the experts or read) about the specific items.

District Resources

Suggested Objective Placement ________

Student Learning Objective(s) A. The student is able to add two or more 3-digit numbers with renaming. B. The student is able to add two or more 4-digit numbers with renaming.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s) ________

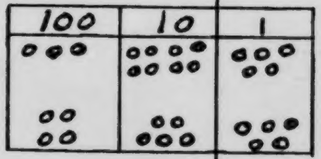
Suggested Activities: Grade(s) 3-4

Title: Addition on a Place Value Chart
Group Size: small group, entire class
Materials: paper, pencil or crayon, 50 counters

Procedure:

- Make a place value chart by dividing the paper into 3 parts and labeling each column as shown.
- Use these steps to find the sum of numbers that are each less than 500.
- (a) Put counters for each number on your chart.
  - (b) Regroup counters if there are 10 or more in a column. Ten ones are replaced by one 10. Ten tens are replaced by one 100.
  - (c) Write the addition problem that is shown by your display.
- Choose other pairs of numbers and find their sums.

Ⓐ



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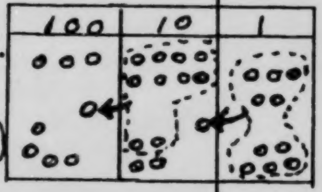


Suggested Monitoring Procedures

Paper and pencil test.

$$\begin{array}{r} 385 \\ +455 \\ \hline \end{array}$$

$$\begin{array}{r} {}^{1\,1} \\ 385 \\ +455 \\ \hline 840 \end{array}$$

Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 105

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, pp. 39-40

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

319

320

SUBJECT: **Mathematics**

SPECIFIC AREA: **Whole Numbers: Subtraction**

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. that subtraction is the inverse of addition.	159-	1-3					
. that subtracting zero from a number does not affect the sum.	165	1					
. the minuend is the quantity from which another quantity is to be subtracted, i.e., 6 - 3 = 3.	167	1-2					
. the subtrahend is the quantity to be subtracted from another, i.e., 4 - 1 = 3.	167	1-2					
the subtraction facts with sums less than five. (mastery)	169	1-2					
the subtraction facts with sums less than nine. (mastery)	171-	2					
the subtraction facts with sums of 18 or less. (mastery)	171-	2-3					
. the difference is the result of subtracting one quantity from another, i.e., 5 - 3 = 2.	167	1-2					
The student is able to:							
. subtract a one-digit number from a one- or two-digit number without renaming (borrowing), i.e., 8 - 2 = 6, 25 - 2 = 23.	175-	1-2					
*. subtract a two-digit number from a two-digit number without renaming (borrowing), i.e., 48 - 26 = 22.	175-	1-2					
. subtract a one-digit number from a two-digit number requiring renaming (borrowing), i.e., 17 - 8 = 9.	177	2-3					
*. subtract a two-digit number from a two-digit number requiring renaming (borrowing), i.e., 37 - 28 = 9.	177	3					
. subtract a one-, two- or three-digit number from a three-digit number requiring renaming (borrowing), i.e., 463 - 7 = 456, 463 - 27 = 436 and 463 - 187 = 276.	179	3					
The student values:							

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ____________

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) The student knows that subtraction is the inverse of addition.

State Goal	1,7,10
District Goal	
Program Goal	6,7

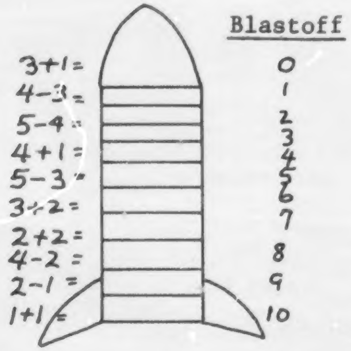
Related Area(s)

Suggested Activities: Grade(s) 1

Title: Blastoff
Group Size: individual or entire class
Materials: duplicated rocket worksheet

Procedure:

- Student makes the rocket blast off by working problems correctly from bottom to top.



Variation:

- Teacher draws rocket on blackboard and students place answers on a separate piece of paper.

Suggested Monitoring Procedures

Teacher observation

Paper-pencil test

Student verbalization

Mini-Test: "Related Sentences"
Group Size: entire class
Materials: exercises to develop the related subtraction sentences from given addition sentences

Procedure:

- Write the related subtraction sentences for:

3 + 4 = 7 ____________

4 + 3 = 7 ____________

Possible Resources

Addition and Subtraction Are Related, (filmstrip), Audio-Visual Division, Holt, Rinehart and Winston, Inc.

District Resources

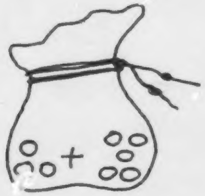
Suggested Activities: Grade(s) 1

Title: Pebble Bag
Group Size: whole class or small group
Materials: paper bags, pebbles

Procedure:

- Pre-determine an equation, such as 3 + 5 = 8.
- Call on student to put 3 pebbles in a bag (class will see and hear pebbles drop into bag). Draw a bag on the board with 3 pebbles in it.
- Another student can add 5 more pebbles to the bag. As he/she does, the teacher adds a set of 5 pebbles to the board drawing.

Board Drawing:



- Ask: "How many pebbles are in the bag? Someone prove it."
- A student can take the pebbles out of the bag, dropping each on the table while the class counts aloud. Put all 8 pebbles back in the bag.
- Restate the addition equation. Show the inverse by having students remove 3 pebbles (erase set of 3 on the board, having class participate in same manner).
- Remove the remaining pebbles, which the students discover will be 5 by counting. Write equation under drawing 8 - 3 = 5.

Suggested Monitoring Procedures

Teacher observation.

Students record the other's results.

Teachers check recorded results.

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) The student knows that subtraction is the inverse of addition.

State Goal	1,7,10
District Goal	
Program Goal	6,7

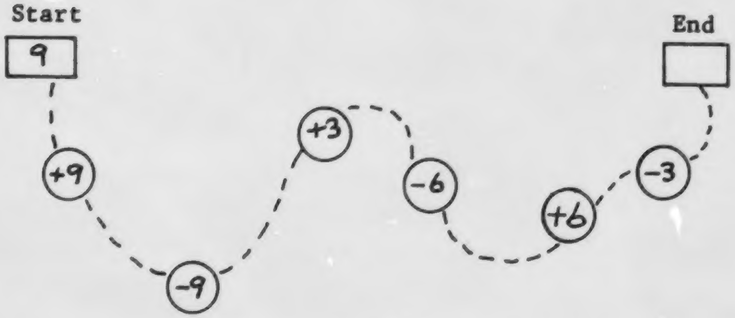
Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Number Trail
Group Size: individual or entire group
Materials: duplicated number trail

Procedure:

- Have students work through the trail to find the ending number by adding or subtracting the number indicated. Example of trail:



Variation:

- Supply the ending number and have students work through to find the starting number.

Suggested Monitoring Procedures

Teacher observation.

Paper-pencil test.

Student verbalization.

Possible Resources

Mathematics for Elementary School Teachers, National Council of Teachers of Mathematics, 1966, pp. 71-73

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) The student knows that subtraction is the inverse of addition.

State Goal	1,7,10
District Goal	
Program Goal	7,6

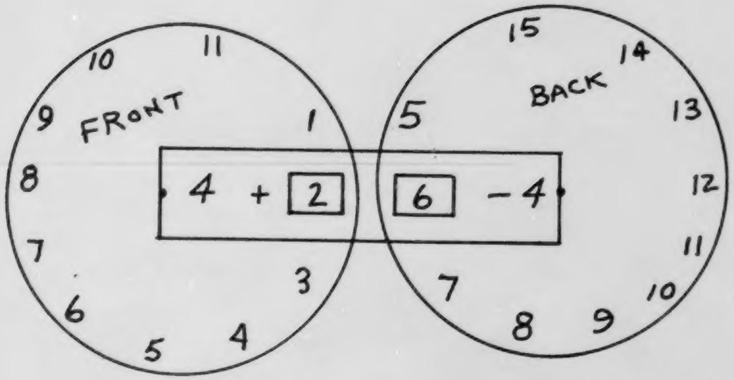
Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Basic Fact Wheel
Group Size: pairs of students
Materials: tagboard, compass, scissors,

Procedure:

- Each student begins with ten points, chips or any object that could refer to points.
- The first student takes his/her turn by moving the window on the wheel spinner, adding 4 to show a number (2, for example); the second student gives the answer 6. A point is lost if the answer is incorrect.
- Turns alternate in choosing the basic facts. The answer to each basic fact will appear in the window on the opposite side of the wheel as:



Suggested Monitoring Procedures

Give ten problems in the form 4+2=6. The student should give subtraction form 6-2=4.

Possible Resources

Kennedy, Leonard M., Models for Mathematics in the Elementary School, Belmont, California, Wadsworth Pub. Co., Inc., 1967, pp. 80-82

District Resources

Suggested Activities: Grade(s) 2-3

- The game ends when one student has lost all the points. Notice that one side of the basic fact wheel shows one operation; the other side shows the opposite operation.

Title: Flash Cards
Group Size: pairs
Materials: tagboard, felt marker

Procedure:

- Make flash cards with addition facts on one side and subtraction opposite on the other side.
  Example:

Front	Back
4 +2	6-2 6-4

- Give each pair of students 20 cards. One student flashes and the other student gives the opposite fact(s) in subtraction or addition form. If the student gives the right answer, he/she gets the card.
- After each student has the opportunity to be a flasher, each adds their total cards. The one that has the most cards is the winner.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) The student knows that subtracting zero from a number does not affect the sum.

State Goal	1,7,10
District Goal	
Program Goal	6,7

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Concentration
Group Size: 2 or 3 players
Materials: make two sets of cards, one with equations where 0 is subtracted from a number--example:

4-0=? 5-0=?

Second set of cards will have the corresponding answer to the equation cards--example:

4 5

Procedure:

- Teacher shuffles both sets of cards together and lays all cards face down in 5 or 6 rows.
- Student, in turn, turns two cards over.
- If cards match, student keeps the pair and gets another turn.
- If the cards do not match, they are placed face down in former positions.
- The game ends when all cards have been taken by the players and the student with the most pairs wins.

Suggested Monitoring Procedures

Paper-pencil test, or students give verbal response to flash cards.

Mini-Test: "Subtracting Zero"
Group Size: entire class
Materials: exercise in subtraction with zero as the subtrahend

Procedure:

- Ask students to circle problems where the difference is the same as the minuend. **Example:**

6	2	8	5	9
-0	-1	-2	-0	-8

Possible Resources

Baratta-Lorton, Mary, *Mathematics Their Way*, Addison-Wesley, 1976, p. 190

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement ______

Student Learning Objective(s) A. The minuend is the quantity from which another quantity is to be subtracted, i.e., 6-3=3. B. The subtrahend is the quantity to be subtracted from another, i.e., 4-3=1. C. The difference is the result of subtracting one quantity from another, i.e., 5-3=2.

State Goal ☐
District Goal ☐
Program Goal ☐

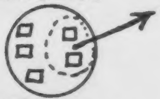
Related Area(s) ______

Suggested Activities: Grade(s) 1-2

Title: Number Sentence Vocabulary (Subtraction)
Group Size: entire class
Materials: paper, pencil, counters, word names on tagboard for: minuend
subtrahend
symbols on tagboard for: "+" and "-"

Procedure:

- Teacher and students form a physical model for 5-3=2.
- Teacher and students write the number sentence for 5-3=2.



- Teacher and students read the number sentence together: "five minus three equals two"
- One student places the word name card for minuend on the chalkrail beneath 5.
- Another student places the card for - between the two numbers.
- Another student places the card for subtrahends on the chalkrail beneath the number 3.
- Another student places the symbol card = in position.
- Another student places the word name for difference below the number 2.

340

Suggested Monitoring Procedures

Mini-Test: "Vocabulary in a Subtraction Sentence"
Group Size: entire class
Materials: see exercise below

Procedure:

- Ask students to do the following in the number sentence 5-2=3:
  - Draw a circle around the minuend.
  - Enclose the subtrahend with a triangle.
  - Place a box or square around the difference.

Possible Resources

Pagne, Joseph N., Mathematics Learning in Early Childhood, N.C.T.M., 1976, pp. 168-169

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 112-113

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, p. 175

Mathematics for Elementary School Teachers, N.C.T.M., 1966, p. 71

District Resources

341

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOO PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) The student knows the subtraction facts with sums less than five. (mastery)

State Goal	1,7,10
District Goal	
Program Goal	2,6

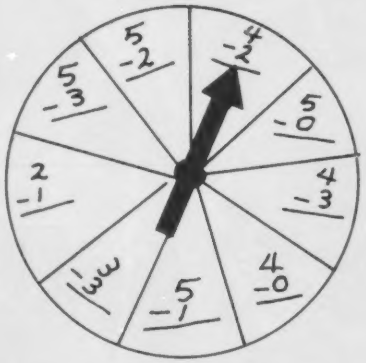
Related Area(s)

Suggested Activities: Grade(s) 1

Title: Spin-A-Difference
Group Size: pairs of students
Materials: 9" x 12" sheets, laminated or covered with contact paper, 2 crayons

Procedure:

- Give one sheet to each student.
- Teacher directs students to spin his/her spinner and determine the difference.
- The student marks the answer with an "X" on the grid (inset) only once.
- The next player does the same with his/her own sheet.



0	4	4
2	5	3
1	1	2

- The first player to get 3 in a row wins.
- When finished, students wipe the sheets off with a tissue for the next players.

Suggested Monitoring Procedures

Mastery of subtraction facts with sums less than 5 implies that a student responds to oral or written queries without hesitation. That is, if asked "What is 5 minus 2?" or if shown $\boxed{\begin{array}{r}5\\-2\end{array}}$ or $\boxed{5-2}$ in written form the student responds instantly from memory. Check one student at a time.

Possible Resources

May, Lola J., Teaching Mathematics in the Elementary School, New York: The Free Press (Macmillan Co.), 1970, pp. 61-67

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 221-224

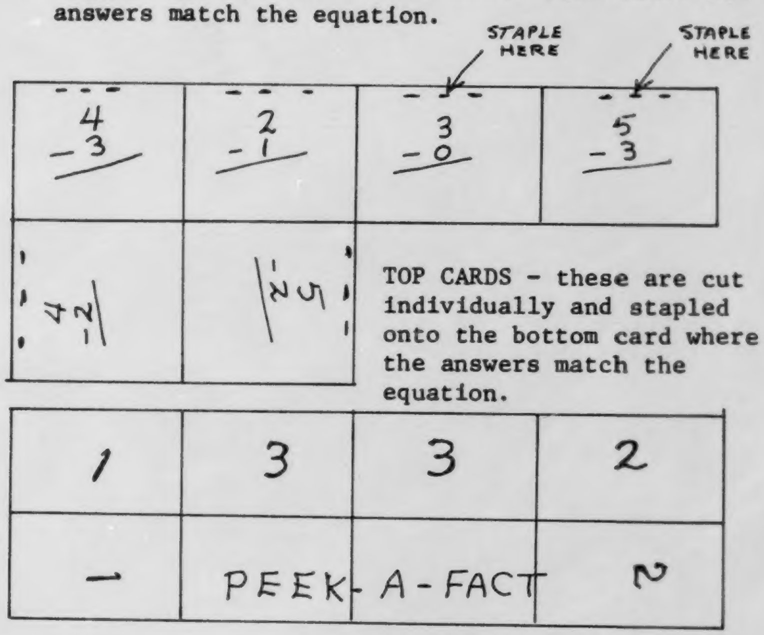
District Resources

Suggested Activities: Grade(s) 1

Title: Peek-A-Fact
Group Size: individual
Materials: 3"x6" cards made by teacher

Procedure:

- Staple the top card to the bottom card where the answers match the equation.



TOP CARDS - these are cut individually and stapled onto the bottom card where the answers match the equation.

BOTTOM CARD

- Student reads the number fact that is on the top of the card (e.g., 4-3).
- Student then determines the answer and checks by lifting up the card and finding the correct answer.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

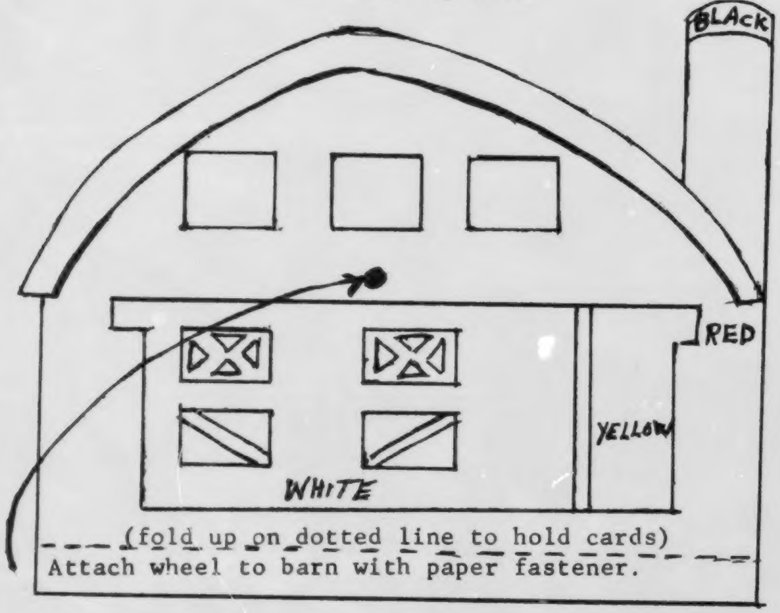
Student Learning Objective(s) A. The student knows the subtraction facts with sums less than nine.
B. The student knows the subtraction facts with sums of 18 or less.

State Goal 1,7,10
District Goal
Program Goal 6

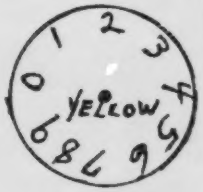
Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Barn Spin
Group Size: individual or teams of two and four
Materials: make barn wheel and subtraction cards from heavy tagboard



(fold up on dotted line to hold cards)
Attach wheel to barn with paper fastener.



18 - 9

Have subtraction facts on cards.

Suggested Monitoring Procedures

Mastery of subtraction facts with sums to 18 implies that a student responds to oral or written queries without hesitation. That is, if asked, "What is 13-7?" or if shown $\begin{array}{r}13\\-7\end{array}$ or $\boxed{13-7}$ in written form, the student in written form, the student responds instantly from memory. Check one student at a time.

Possible Resources

May, Lola M., Teaching Mathematics in the Elementary School, New York: The Free Press, (Macmillan Co.), 1970, pp. 61-67

District Resources

Suggested Activities: Grade(s) 2-3

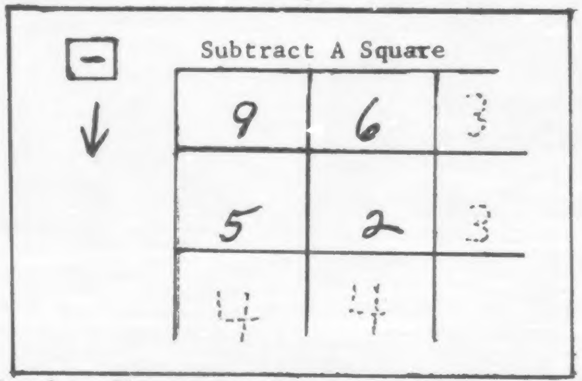
Procedure:

- Teacher deals the cards to the students or teacher can select one student to deal.
- Each student takes turns spinning the spinner. The player tries to spin a sum that is found on one of the playing cards. If the sum matches the card held by the player, the subtraction card is placed in the barn pocket.
- The object is to get rid of all the cards.

Title: Subtract A Square
Group Size: individual
Materials: worksheet

Procedure:

- Teacher directs student to fill in the correct answer in the blank squares.



- Teacher directs students to subtract across and down.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student knows the subtraction facts with sums less than nine. (mastery) B. The student knows the subtraction facts with sums of 18 or less. (mastery)

State Goal 1,7,10

District Goal

Program Goal 6

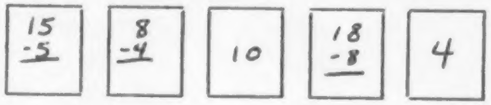
Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Subtraction Cards
Group Size: small group
Materials: write 20 subtraction combinations on cards with sums less than nine; write the answers on 20 other cards

Procedure:

- Teacher mixes the cards and deals six to each of four players (teacher may select one student to deal).
- Teacher directs students to lay the remaining cards in the set of 40 face down on the table. For example, suppose the following were one player's cards:



- The student may lay down one pair (15-5) or (18-8) with the same answer card (10), as only one combination card and one answer card may be used at the same time.
- Teacher directs student to tell the other player that he/she has a 15-5 and wants its answer. If the other player has the card, he must give it to the requesting player and the first player then puts down another pair.
- The player may continue to call for a combination card until he/she fails to receive a mate for it.

Suggested Monitoring Procedures

See previous page for suggested procedure.

Possible Resources

Pagne, Joseph N. (editor). Mathematics Learning in Early Childhood, NCTM, 1976, pp. 178-180

District Resources

Suggested Activities: Grade(s) 2-3	Suggested Monitoring Procedures	Possible Resources
Then the player must draw. If the card drawn is a match, player may draw again. If card is not a match, player gives up turn. . The first player to lay down all the cards in pairs is the winner.		
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) A. The student is able to subtract a one-digit number from a two-digit number without renaming (borrowing), e.g., 25-2=23. B. The student is able to subtract a two-digit number from a two-digit number without renaming (borrowing), e.g., 48-26=22.

State Goal 1,7,10

District Goal

Program Goal 1,2,6

Related Area(s)

Suggested Activities: Grade(s) 1-2

Title: Bean Sticks and Beans

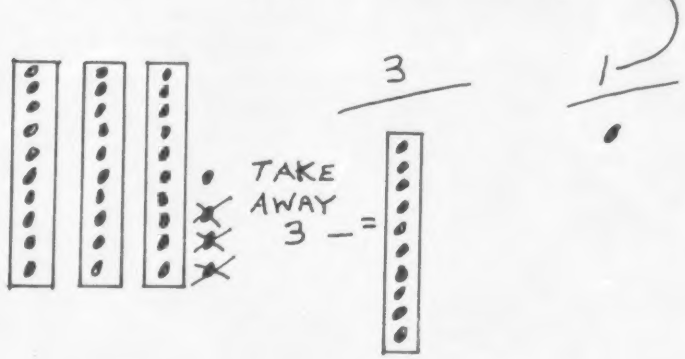
Group Size: any number

Materials: bean sticks (10 beans glued to a tongue depressor), beans, ditto worksheet or laminated card (for individual work)

Procedure:

- Teacher demonstrates to the students how to use the bean sticks as 10's units and the loose beans as one's units when computing answers to problems on worksheets.
- Leave space by each problem to lay out beansticks and beans.

Example: 34 - 3 = 31



Suggested Monitoring Procedures

Paper-pencil test.

Teacher observes students making new sets using bean sticks and beans and recording answer.

Possible Resources

Pagne, Joseph N. (editor) Mathematical Learning in Early Childhood, NCTM, 1976, pp. 175-177.

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student is able to subtract a one-digit number from a two-digit number, requiring (borrowing), e.g., 17-8=9. B. The student is able to subtract a two-digit number from a two-digit number, requiring renaming (borrowing), e.g., 37-28=9.

State Goal	1,7
District Goal	
Program Goal	6

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Stump The Experts
Group Size: entire class
Materials: duplicated worksheet of items like those shown below:

$$\begin{array}{rrrr} 34 & 41 & 36 & 25 \\ -6 & -7 & -8 & -7 \\ \hline 28 & 33 & 28 & 16 \end{array}$$

$$\begin{array}{rrrr} 94 & 86 & 20 & 77 \\ -8 & -9 & -3 & -8 \\ \hline 86 & 67 & 17 & 59 \end{array}$$

Procedure:

- Teacher directs students to circle the incorrect answers and write correct answer below. Several students could have a race to see who finishes first, or work against the clock.

Extension:

- Include the subtraction of two-digit numbers from two-digit numbers requiring renaming.

Variation:

- Make worksheet with two-digit numbers subtracted from two-digit numbers requiring renaming, i.e.,

$$\begin{array}{rrr} 34 & 26 & 45 \\ -16 & -17 & -26 \\ \hline 18 & 9 & 19 \end{array}$$

- Have students circle incorrect answers and write correct answer below.

360

Suggested Monitoring Procedures

Paper-pencil test on these types of problems.

Record success on practice sheets with suggested types of problems.

Possible Resources

District Resources

361

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) A. The student is able to subtract a one-, two- or three-digit number from a three-digit number, requiring renaming (borrowing), e.g., 463-7=456; 463-27=436 and 463-187=276.	State Goal	1,7,10
	District Goal	
	Program Goal	6

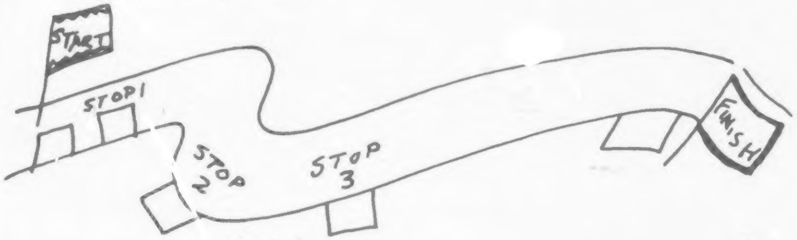
Related Area(s)

Suggested Activities: Grade(s) 3

Title: Subtraction 500
Group Size: individual or pair of students
Materials: racetrack with worksheets

Procedure:

- On a bulletin board or large table make a racetrack with Start, Finish and four pit stops.
- At the Start, and each pit stop, place an envelope with five subtraction problems more difficult at each stop. For example, Start--should have problems in which a one-digit number is subtracted from a 3-digit number; pit stop #1, problem in which a 2-digit number is subtracted from a 3-digit number; at pit stop #2, etc.
- Each student begins with the start sheet. When these problems are correctly solved, the student moves the car to the first pit stop, solves problems and moves to the next pit stop, and so on until he/she has finished the race.
- Choose one student to be official "checker" for each pit stop. Give that student an answer sheet for the problems.



Suggested Monitoring Procedures

Possible Resources

Experiences in Mathematical Ideas, Volume 1, NCTM, 1970, pp. 62-65

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 176-177

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Multiplication

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
• that multiplication can be pictured as the combination of equal sets.	183-	3					
• a factor is one of two or more quantities having a designated product.	185	3					
• a product results when two numbers are multiplied.	185	3					
• the product of any number multiplied by the factor of zero is zero (6 x 0 = 0).	187-	3					
• the product of any number multiplied by the factor of one is that number (3 x 1 = 3).	189-	3					
*. the multiplication facts with products through 81 (mastery).	193-	3-5					
The student is able to:							
*. multiply one-, two- and three-digit numbers by a one-digit number: 4 x 5 = 20 $\begin{array}{r}22\\ \times5\\ \hline 110\end{array}$ $\begin{array}{r}222\\ \times 5\\ \hline 1{,}110\end{array}$	195	3-5					
• estimate products using concepts of "greater than" and less than".		4-6					
The student values:							
• the quick and accurate recall of facts.		3-8					

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student knows that multiplication can be pictured as the combination of equal sets.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s) graphs, science

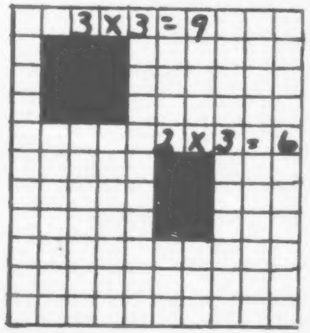
Suggested Activities: Grade(s) 3

Title:
Group Size: large group
Materials: use 1/2" graph paper, overhead projector transparency

Procedure:

- Color in the squares that represent the multiplication combinations you have selected.
- Use board or overhead projector to introduce the activity. Using graph paper, show the combinations.

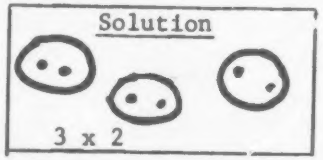
Example:



Suggested Monitoring Procedures

Mini-Test: "Showing Multiplication Through Equal Sets:
Group Size: entire class
Materials: pencil and paper
Procedure:

- Make a drawing to show 3 x 2 by means of sets



Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 181-183

Kelley S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 70 and p. 77

Teaching Elementary School Mathematics for Understanding, Marks, Purdy and Kinney, ch. 6, pp. 125-157

Number Line
Peg Board
Bead Frame

District Resource

Suggested Activities: Grade(s) 3

Title: Multiplication Using Sets
Group Size: entire class
Materials: three disjoint sets, i.e., sets in which no member belongs to any other set

Procedure:

- Ask each student to determine the number of items in each of the three sets.
- Write the multiplication sentences for the three sets., e.g.,

$$\underset{\boxed{\text{sets}}}{\overset{}{\underset{\text{No. of}}{3}}} \times \underset{\boxed{\text{No. in each set}}}{2} = \underset{\boxed{\text{product}}}{6}$$

Suggested Monitoring Procedures

Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 134

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) A. The student knows a factor is one of two or more quantities having a designated product. B. The student knows that a product results when two numbers are multiplied.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s)

Title: Multiple Ways of Reading Multiplication Sentences

Group Size: small group or entire class

Materials: counters

Procedure:

- Have students make an array to show six sets of five counters.
- Then have students write the multiplication sentences that describe their picture.
- Have students read these number sentences together: "Six times 5 equals 30."
- Have students read to indicate they know how to describe these sentences using the terms factors and product:

"The product of the factors 6 and 5 equals 30."

.....
.....
.....
.....
.....
.....

6x5 = 30

$$\begin{array}{r} 5 \\ \underline{x6} \\ 30 \end{array}$$

Suggested Monitoring Procedures

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 183

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 136

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student knows the product of any number multiplied by the factor of zero is zero, e.g., 6 x 0 - 0.

State Goal	1,7,10
District Goal	
Program Goal	

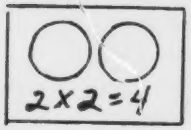
Related Area(s)

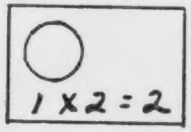
Suggested Activities: Grade(s) 3

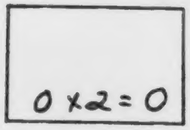
Title: Using Zero as A Factor
Group Size: entire class
Materials: overhead projectors

Procedure:

- Use an overhead projector or chalkboard to develop examples such as the following with the students:







- Do several more examples such as 2 x 0, 3 x 0, 5 x 0, to develop what happens to the products when 0 is used as a factor.

Suggested Monitoring Procedures

Mini-Test: "Factors of Zero"
Group Size: entire class
Materials: exercise with a variety of one-digit factors including zero

Procedure:

- Students are to circle all problems where the product is "0".

Example:

0	8	4	5	1
x1	x0	x1	x2	x7

Possible Resources

May. Lola J., Teaching Mathematics in the Elementary School. The Free Press: (Macmillan Co.), New York, 1970, pp. 104-105

Marks, John L., Teaching Elementary School Mathematics for Understanding, McGraw-Hill, 1965, pp. 136

Pagne. Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics. 1976, p. 154

Suggested Activities: Grade(s) 3

Suggested Monitoring Procedures

Possible Resources

Title: Special Property of Zero
Group Size: entire class or small groups
Materials: paper cups, buttons or beans

Procedure:

- Divide the class or group and give them six cups and twelve buttons or beans. Have each group use four of the six cups and place two buttons or beans in each cup. Ask them how many cups they are using, how many buttons or beans are in each cup and how many buttons or beans in all. Write a multiplication sentence on the board showing the total number of beans.
- Have the groups use three cups with no buttons or beans. Ask them how many cups they are using and how many buttons or beans in all.
- Have a student write a multiplication sentence on the board showing how many buttons or beans in all. Repeat this procedure until the concept of zero as a factor is well understood.

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student knows the product of any number multiplied by the factor of one is the number, e.g., 3 x 1 = 3.

State Goal	1,7,10
District Goal	
Program Goal	

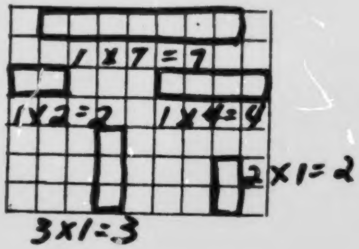
Related Area(s)

Suggested Activities: Grade(s) 3

Title: One As A Factor
Group Size: entire class
Materials: overhead projector, 1/2" graph paper

Procedure:

- Teacher draws a grid on the overhead, similar to students' graph paper.
- Teacher gives multiplication problem (e.g., 3 x 1) and teacher marks it off on the grid and students on their graph.
- Teacher gives students various problems using the factor of one (e.g., 1 x 3, 1 x 2, 2 x 1, etc.)



Grid on overhead and graph paper.

Suggested Monitoring Procedures

Mini-Test: "Factors of 1"
Group Size: entire class
Materials: Exercise with a variety of one-digit factors including 1

Procedure:

- Students are to circle all problems where one factor neither increases or decreases the other factor.

Example:

$$\begin{array}{r} 0 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ \times 1 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 0 \\ \hline \end{array}$$

Possible Resources

Marks, John L., Teaching Elementary School Mathematics for Understanding, New York, McGraw-Hill Cook Co., 1970, p. 1

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 140

District Resources

Suggested Activities: Grade(s) 3

Title: Bean Bag Toss
Group Size: pairs of students
Materials: 2 bean bags, matrix draw on butcher paper or made with masking tape on the floor, multiplication facts are on the matrix

Procedure:

Matrix drawn on paper on floor.

7 x1	1 x2	6 x1
3 x1	1 x5	12 x1
10 x1	1 x9	4 x1

- Each player tosses a bean bag and tells the answer to the comgination in that square. The player having the greater product scores a point.
- If the products are equal, neither player scores a point. The player with the most points wins the game.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student knows the product of any number multiplied by the factor of one is the number, e.g., 3 x 1 = 3.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources
Title: Factor of One **Group Size:** small group/entire class **Materials:** crayon, newsprint **Procedure:** . Have students draw an array to show 1 x 4 = 4 and label their drawing. . Have students draw an array to show 4 x 1 = 4 and label their drawing. . Have students draw an array to show 1 x 7 = 7, label it, and so on.		Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 183 **District Resources**

387

388

Suggested Activities: Grade(s) ______

Suggested Monitoring Procedures

Possible Resources

District Resources

389

390

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-5

Student Learning Objective(s) The student knows the multiplication facts with products through 81 (mastery).

State Goal	1,7,10
District Goal	
Program Goal	

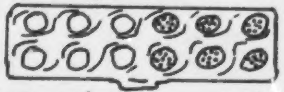
Related Area(s)

Suggested Activities: Grade(s) 3-5

Title: Egg Carton Multiplication
Group Size: partners
Materials: egg carton
81 counters

Procedure:

- $\boxed{7's}$ Start by putting 7 counters in one pocket.
- Write the multiplication fact $\begin{array}{r}7\\ \underline{x1}\\ 7\end{array}$



- Put 7 counters in the second pocket and so on until counters have been put in each of 9 pockets.
- Write the multiplication fact that is shown by the display each time counters are put in another pocket.
- $\boxed{8's}$ Do the same thing with sets of 8 counters.
- $\boxed{9's}$ Do the same thing with sets of 9 counters.

Suggested Monitoring Procedures

Mastery of Multiplication facts implies that a student responds to oral or written queries without hesitation. That is, if asked, "What is 6 times 7?" or shown in written form $\boxed{6x7}$ or $\boxed{\begin{array}{r}6\\ x7\end{array}}$ the student responds instantly.

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 184-186

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, pp. 72-73

D'Augustine, Charles, Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 147

District Resources

Suggested Activities: Grade(s) 3-5

Title: Products Race
Group Size: partners
Materials: multiplication charts

Procedure:

- Complete the multiplication chart below by writing the product where the row and the column for the factors meet.

X	8	0	6	2
3				
5				
8				
7				

- Play "Product Race" with a friend.
- Write four factors across the top of one of the blank charts and four factors at the side. Use factors that are less than 10.
- Trade charts with your friend. See who can complete the other's chart first.

X				

Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Objective Placement 3-5

Student Learning Objective(s) The student is able to multiply one-, two- and three-digit numbers by a one-digit number: 4x5=20

$$\begin{array}{rr} 22 & 222 \\ \underline{\times 5} & \underline{\times 5} \\ 110 & 1110 \end{array}$$

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3-5

Title: Multiplication Toss

Group Size: partners

Materials: 3 cubes marked from 1 through 6
10 counters

Procedure:

- Roll the cubes. One player arranges them for the other player to solve.
- Then the other player arranges them in a different order to make a problem for the first player to solve. In each case, the factor must be less than 10.
- Each time a problem is solved correctly, the player takes a counter.
- The winner is the player who receives 5 counters first.

Suggested Monitoring Procedures

Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 150-151

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Division

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
• that division is the inverse of multiplication.	199-	3-4					
• the basic division facts (mastery).	203	3-5					
The student is able to:							
• divide a one- or two-digit number by a one-digit number without remainders.	205	3-4					
The student values:							
• the quick and accurate recall of facts.	207-	3					

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ____________

400

401

Suggested Objective Placement 3-4

Student Learning Objective(s) The student knows division is the inverse of multiplication.

State Goal 1.7.10

District Goal

Program Goal

Related Area(s)

Suggested Activities: Grade(s) 3-4

Title: Blocks and Boxes
Group Size: small group
Materials: 12 blocks for each student, 3 boxes for each student

Procedure:

- Give the students each 12 blocks and 3 small boxes. The students are to fill the boxes with 4 blocks in each box. Ask students how to find the number of boxes needed and develop the sentence: ________________ x4=12.
- Then explain another way to find the answer. Since we are dividing 12 blocks into groups of four, we can write 12÷4=____________. Ask students to find the missing factor in ___________ x 4 = 12 and explain that 12÷4=3.

Grades 3-4

Title: Division Wheel
Group Size: individual or small group
Materials: tagboard, compass, scissors, brass fasteners (pairs). Make 2 circles of tagboard and paste them together. On the face write the numbers 1 through 9 and on the reverse, write the product of 1 through 9 multiplied by the factor you are working with. (Example: Using 8 as the factor, the numbers would be 8, 16, 24, etc.) Cut a

Suggested Monitoring Procedures

Mini-Test: "Showing Division as the Inverse of Multiplication
Group Size: one student
Materials: 12 or more counters
Procedure:

- Use your counters to form an array to show 3x4=12

that is:
. . . .
. . . .
. . . .
. . . .

- Now use this array to show 12÷4=3.
  - In this number sentence what does the 12 refer to? (the entire set or product)
  - What does the 4 refer to? (the number in each set)
  - What does the 3 refer to? (the number of sets)

Possible Resources

May, Lola J., Teaching Mathematics in the Elementary School, New York: The Free Press (Macmillan Co.), 1970, pp. 117-124

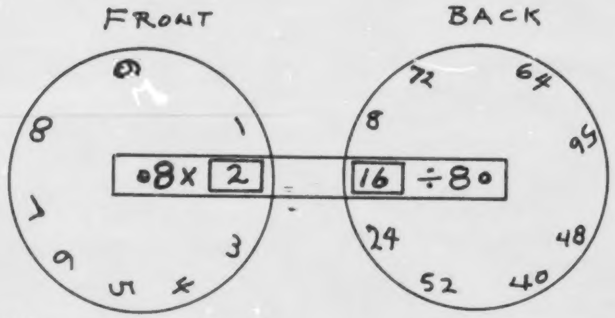
Marks, John L., Teaching Elementary School Mathematics for Understanding, McGraw-Hill, 1965, pp. 126-138

Pagne, Joseph N., Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics. 1976, p. 187

District Resources

Suggested Activities: Grade(s) 3-4	Suggested Monitoring Procedures	Possible Resources

around the wheel. On the face side write "8x" and on the reverse side, "÷8". Cut windows in the strip to show the numbers. (See diagram.) Attach the strip with a brass fastener.



Procedure:

- Each student begins with 25 points. The first student takes a turn by moving the window on the wheel spinner (multiplying) to show a number (e.g., 2). The second student gives the answer (16). A point is lost for an incorrect answer. Turns alternate. The answer to each basic fact will appear in the window on the opposite side of the wheel as shown.
- The game ends when one student has no points left.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student knows division is the inverse of multiplication.

State Goal	1,7,10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3-4

Title: Concentration
Group Size: 2-4 for each set of cards
Materials: set of Concentration cards -- sets need not be the same, but should be set up as follows:

(a) 20 to 30 cards
(b) separated into 2 equal stacks
(c) make matching pairs of cards -- on one card a multiplication fact (2x6 or 2x6=12) and on the other card the division fact that is the inverse of the multiplication fact (12÷6 or 12÷6=2). Be careful not to duplicate facts (e.g., don't use the above cards, and cards for 6x2 and 12÷2, in the same set unless students are quite experienced with the concept.

Procedure:

- Mix cards thoroughly.
- Place cards in rows, upside down on the playing surface.
- First player turns over any 2 cards, laying them down in place. If they match (e.g., 2x6 and 12÷6) the player can pick them up. If they don't match, they must be turned over and left in place.
- The next player turns over any 2 cards of his/her choice. If they match, they are picked upl if not, they are turned over again.
- Players continue until all matching pairs have been picked up.

Suggested Monitoring Procedures

Paper-pencil test as follows: A random list of multiplication facts in the left-hand column -- without answers. In the right-hand column, a list of matching division facts in a different order.

Students are to draw lines from each multiplication fact to the matching division fact.

Example:

4x6	30-5
5x2	24-8
3x8	28-7
4x7	24-6
6x5	10-2

Record the number correct.

Possible Resources

Kelley, S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 79

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement 3-5

Student Learning Objective(s) The student knows the basic division facts (mastery).

State Goal

District Goal

Program Goal

Related Area(s)

Suggested Activities: Grade(s) 3-5

Title: Chalkboard Race
Group Size: two small groups or teams
Materials: Chalk and chalkboard

Procedure:

- Write two sets of numbers on the board, e.g.,

☐ ÷ by 6 18 36 42 54 6 24
3

☐ ÷ by 6 24 12 48 30 18 36
4

- Have two players, one from each team, go to the chalkboard.
- Say "Divide by 6" and have the players record the quotients beneath the numbers.
- The first one finished with all the correct quotients wins a point for his/her team.
- Use a different factor with the next pair of players.

Suggested Monitoring Procedures

Mastery of Division Facts implies that a student responds to oral or written queries without hesitation. That is, if asked, "What is 12 divided by 3?" or if shown $\boxed{12÷3}$ in written form, the student responds instantly from memory.

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 185

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student is able to divide a one- or two-digit number by a one-digit number without remainders.

State Goal	
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3-4

Title: Egg Carton Division
Group Size: partners
Materials: egg carton, 25 counters

Procedure:
- Take turns doing Tasks 1 and 2.
- Task 1:
  Pick one of the division facts given below. Put counters in the pockets of the egg carton to show the fact.
- Task 2:
  Tell the fact that is shown by the display:
  $4 \div 2 = 2$ $6 \div 2 = 3$ $10 \div 2 = 5$ $12 \div 3 = 4$
- Task 3:
  Both solve the following using any method.

Suggested Monitoring Procedures

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 186-187

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-8

Student Learning Objective(s) The student values the quick and accurate recall of facts.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s)

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources

Title: The Shortcut
Group Size: partners
Materials: pencil and paper, stopwatch, set of 4 exercises, two problems in each set

Procedure:

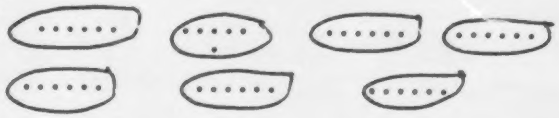
- Teacher gives two students the following problem to solve; each student does every other problem.

(6x4 (7x6 (3x9 (7x7
(5x7 (5x8 (8x4 (8x8

- The first problem is to be solved by using arrays. Each student is timed by his/her partner., eg.,

```
6x4= ....
     ....  24
     ....  Partners take turns solving problems.
     ....
     ....
     ....
```

- The second problem is to be solved by using sets, e.g., 7x6=42



District Resources

418

419

Suggested Activities: Grade(s) 3

- The third problem is to be solved by repeated addition., e.g., 3x9= 9+9+9= 27 or

$$\begin{array}{r} 9 \\ 9 \\ +9 \\ \hline 27 \end{array}$$

- Now use the short cut method.
  Call on your memory bank to solve problem., e.g., 7x7=49
- Compare times to solve problems using each method.
- The value of an accurate "shortcut" method should be self-evident.

Suggested Monitoring Procedures

Possible Resources

District Resources

SUBJECT: Mathematics

SPECIFIC AREA: Whole Numbers: Story Problems

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4
The student knows:							
. characteristics of a number sentence are operational sign(s) and an equal sign.	211	2-8					
. basic facts.	213	3-5					
. that - and + are inverse operations.	215	3-4					
. not all information given in a story problem may be relevant to the solution of the problem.	217	2-8					
. clue words (total, sum, more, product, remainder, average, quotient).	219	3-5					
The student is able to:							
. develop (write) a story problem from a given number sentence.	221	2-8					
. project a mental image (draw a picture) of the problem from an appropriate story problem.	223	2-8					
. identify relevant information necessary for solution.	225	2-8					
*. solve story problems with one operation.	227	2-8					
The student values:							
. analysis and solution of story problems as the ultimate goal of mathematics.		2-8					

422

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ________________

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-8

Student Learning Objective(s) The student knows that the characteristics of a number sentence are operational sign(s) and an equal sign.

State Goal ☐
District Goal ☐
Program Goal ☐

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Show Me The Sign
Group Size: entire class
Materials: five operational signs on cards for each student (cards about the size of regular playing cards)

Procedure:

- Teacher: Students hold up correct sign card.
  - Show me the sign that is read "plus".
  - Show me the sign that is read "minus".
  - Show me the sign that is read "times".
  - Show me the sign that is read "divided by".
  - Show me the sign that is called "equals".

Suggested Monitoring Procedures

Mini-Test: "Signs"
Group Size: entire class
Materials: exercise as below
Procedure:

- Complete each number sentence by placing operational and equal signs in boxes.

3 ☐ 2 ☐ 5

5 ☐ 2 ☐ 3

Possible Resources

Pagne, Joseph N., Mathematical Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 259-260

Kane, Robert, Helping Children Read Mathematics, American Book Co., 1974, pp. 58-63

Ginsburg, Herbert, Children's Arithmetic: The Learning Process, D. Van Nostrand Co., 1977, pp. 84-85

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 3-5

Student Learning Objective(s) The student knows the basic facts.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Beat The Bounce
Group Size: small group
Materials: one ball

Procedure:

- One student takes a ball and holds it at shoulder height.
- The student with the ball calls out a subtraction phrase (e.g., 9-2).
- Then the student calls out the first name of another student in the group.
- As the name is called, the ball is dropped.
- The student whose name is called has to respond with the correct answer before the ball hits the floor.
- If he/she does respond correctly, that player gets to be the questioner.
- If he/she misses, the original student gets to continue dropping the ball.
- The teacher or a monitor records the facts that are missed by individual students.
- At the game's end, each student studies the facts he/she missed.

Suggested Monitoring Procedures

Basic Facts Mastery

Mastery of the basic facts implies the ability to respond to oral and written queries without hesitation. That is, the student recalls the basic fact from memory immediately when asked.

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 261

D'Augustine, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 91-92

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

401

402

SMALL SCHOOL PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student knows that - and + are inverse operations.

State Goal	☐
District Goal	☐
Program Goal	☐

Related Area(s)

Suggested Activities: Grade(s) 3

Title: Related Sentences
Group Size: entire class
Materials: none

Procedure:

- Have two girls stand at the front of the classroom.
- Have five boys join them.
- Write the number sentence to illustrate this action, i.e., 2+5=7.
- Have five boys stand at the front of the classroom.
- Have two girls join them.
- Write the number sentence to illustrate this action, i.e., 5+2=7.
- Repeat the first action and have the five boys return to their seats and write the subtraction sentence describing the action, i.e., 7-5=2.
- Repeat the second action and have the two girls return to their seats and write the subtraction sentence describing the action, i.e., 7-2=5.
- Then discuss why the following are related sentences: 2+5=7, 5+2=7, 7-5=2, 7-2=5.

Suggested Monitoring Procedures

Mini-Test: "Related Sentences"
Group Size: entire class
Materials: exercise as below

Procedure:

- Write the related number sentences for each pair of sentences:

A. 3+2=5 __________
2+3=5 __________

B. 7-4=3 __________
7-3=4 __________

Possible Resources

Lovell, Kenneth, The Growth of Understanding in Mathematics, Holt, Rinehart and Winston, 1971, pp. 54-55

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-8

Student Learning Objective(s) The student knows that not all information given in a story problem may be relevant to the solution of the problem.

State Goal ☐
District Goal ☐
Program Goal ☐

Related Area(s) ____

Suggested Activities: Grade(s) 2-3

Title: Find The Extra Number
Group Size: small group
Materials: two problems with irrelevant data

Procedure:

- Write problems to be discussed orally on the chalkboard.
- Read each problem orally.
- Determine what is asked in each problem.
- Find the extra number in each problem.
- Write the number sentence to describe each problem.
- Solve each problem.

Problem 1: Josie bought a box of 48 crayons for $.90. She gave the clerk $5.00. How much change should she receive?
Extra number (48) Number sentence ____
Answer ____

Problem 2: Bill spent two hours cutting the lawn and 20 minutes helping Dad cut three bushes. How many minutes was this?
Extra number (3) Number sentence ____
Answer ____

Suggested Monitoring Procedures

Possible Resources

Westcott, Alvin N., Creative Teaching of Mathematics in the Elementary School, Allyn and Bacon, 1967, pp. 111-132

Kane, Robert, Helping Children Read Mathematics, American Book Co., 1974, p. 66

Schall, William E. (editor), Activity-Oriented Mathematical Readings for Elementary Teachers, Prindle, Weber and Schmitt, 1976, pp. 223-226

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-5

Student Learning Objective(s) The student knows clue words (total, sum, more, product, remainder, average, quotient).

State Goal ☐
District Goal ☐
Program Goal ☐

Related Area(s)

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources

Title: Clue Words
Group Size: small group/entire class
Materials: problems to discuss

Procedure: **Teacher:**

- "What is the clue word for each problem, that is, what is the word that tells the correct operation (+, -, x, ÷)?

Problem 1:
$1.50 for a ball
$2.75 for a bat.
Find total cost. Answer: ________

Problem 2:
Three is one addend.
Four is another addend.
What is their sum? Answer: ________

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOO[illegible] PROJECT

Suggested Objective Placement 2-8

Student Learning Objective(s) The student is able to identify relevant information necessary for solution.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Problem-Solving
Group Size: small group
Materials: story problems

Procedure:

- Teacher writes one verbal problem at a time on the chalkboard for oral discussion.
- Each problem presents the students with four tasks:
  1. What does the problem ask?
  2. What are the important facts?
  3. What information is not needed?
  4. Write a number sentence for each problem. Solve.

Sample Problems:

A. Susie bought a piece of cake for 40 cents, ice cream for 25 cents, and a ball for 69 cents. How much did she spend for food?

B. There are 3 basketballs, 2 footballs, 5 hockey sticks, and 4 tennis balls in the gym. How many balls are there in all?

Suggested Monitoring Procedures

Mini-Test: "Extra Information in Problems"
Group Size: entire class
Materials: problems with irrelevant information (see below)

Procedure:

- Read the following problem carefully.
- Decide what is asked.
- Try to write a number sentence that illustrates the problem.
- Solve the problem and indicate in the space after "Extra Number" any number that was not needed. For Example: On Tuesday 230 of the 240 children at Halley School were present. The principal said that the largest number absent any day that week was 15. How many were absent on Tuesday?

Answer ________
Extra Number________

Possible Resources

Schall, William E. (editor), Activity-Oriented Mathematics Readings for Elementary Teachers, Prindle, Weber and Schmitt, Inc., 1976, pp. 223-224

Henney, Maribeth, "Improving Mathematics Problem-Solving Ability Through Reading Instruction", Arithmetic Teacher, April 1971, pp. 223-226

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement ____

Student Learning Objective(s) The student is able to develop (write) a story problem from a given number sentence.

State Goal	
District Goal	
Program Goal	

Related Area(s) ____

Suggested Activities: Grade(s) 2-8

Title: Pictures and Stories
Group Size: small group/entire class
Materials: chalkboard

Procedure:

- Teacher writes a number sentence on the chalkboard, e.g., 5+3= ☐ .
- Students are give three tasks:
  1. Make a picture for your number sentence.
  2. Make up a story to go with your picture.
  3. Complete the number sentence, i.e., 5+3=8.
- Continue to write other number sentences involving different operations.

419

Suggested Monitoring Procedures

Mini-Test: "Writing Story Problems"
Group Size: entire class
Materials: number sentences such as the one below:

Procedure:

- Here is a number sentence. 5+3= ☐
- Make a picture for the number sentence.
- Make up a story to go with your picture.

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 260

VanRoekel, Byron H., How to Read Mathematics, Harper and Row, 1973, p. 29

Schall, William E. (editor), Activity-Oriented Mathematics Readings for Elementary Teachers, Weber and Schmitt, Inc., 1976, pp. 210-214.

Henderson, George L., Let's Play Games in Mathematics, Vol. 2, 1970, p. 55

Biggs, E. E., Mathematics in Primary Schools, Her Majesty's Stationary Office, 1969, p. 37

District Resources

450

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ______

Student Learning Objective(s) The student is able to project a mental image (draw a picture) of the problem from an appropriate story problem.

State Goal	☐
District Goal	☐
Program Goal	☐

Related Area(s) ______

Suggested Activities: Grade(s) ______

Title: A Picture Tells The Story
Group Size: small group or entire class
Materials: story problems

Procedure:

- Teacher presents a story problem to the class such as the fllowing:
  "There are nine frogs by the side of the pond. One frog jumps into the pond. How many frogs are left by the side of the pond?"
- Read the story to and with the students.
- Then assign the following tasks:
  1. Draw a picture that tells the story.
  2. Write the number sentence that tells a story about the picture, i.e., 9-1=☐
  3. Solve the number sentence, i.e., 9-1=8.

Suggested Monitoring Procedures

Mini-Test: "Problem Solving With Drawings"
Group Size: entire class
Materials: problem solving exercises to illustrate

Procedure:

- Read the problem carefully and then use a drawing or diagram to help you solve it.
  Example: Al bought six valentines marked "3 for 25¢. What was the cost of his purchase?"

Possible Resources

Kane, Robert, Helping Children Read Mathematics, American Book Co., 1974, pp. 64-66.

Westcott, Alvin M., Creative Teaching of Mathematics in the Elementary School, Allyn and Bacon, 1967, pp. 111-132

Schall, William E. (editor), Activity-Oriented Mathematics Readings for Elementary Teachers, Prindle, Weber and Schmitt, Inc., 1976, pp. 210-214

Kennedy, Leonard, Models for Mathematics in the Elementary School, Wadsworth Publishing Co., 1967, pp. 96-97

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) The student is able to solve story problems with one operation.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s) ________

Suggested Activities: Grade(s) 2-8

Title:	For Problem Solvers
Group Size:	small group/entire class
Materials:	one-step problems

Procedure:

- Teacher presents group with one-step story problems written on chalkboard.
- After the problem has been read to and with the group, three tasks are assigned:
  - What does the problem ask?
  - What are the important facts?
  - Write a number sentence for the problem. Solve.

Example:
"Seven scouts go on a camping trip. One car can hold five scouts. How many will need to ride in another car?"

Problem asks: How many scouts will not be able to ride in first car?
Important facts: . Number of boys who will ride in the cars. . The number who will ride in the second car.

- Number sentence 7-5= ☐
- Answer sentence 7-5=2

Suggested Monitoring Procedures

Mini-Test:	"One-Step Problems"
Group Size:	entire class
Materials:	one step verbal problems

Procedure:

- Read the problem carefully.
- Determine what is asked.
- Draw a picture to illustrate the problem.
- Write a number sentence to solve the problem.
- Solve the problem.

Example: Bill bought 18 guppies. Guppies sell at 6 for 10¢. How much did the guppies cost?

Possible Resources

Henney, Maribeth, "Improving Mathematics Verbal Problem-Solving Ability Through Reading Instruction", Arithmetic Teacher, April 1971, pp. 223-226

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, Chapter 4.

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

SUBJECT: Mathematics

SPECIFIC AREA: Fractions

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. fractional regions of a model: halves.	231	K					
. fractional regions of a model: halves, thirds, fourths.	233-	1-2					
. the fractional parts 1/2, 1/4, 1/3, 2/3, 2/4, 3/4 when given a set or grouping.	239-	2-3					
. a fraction having like denominator and numerator represents one. Example: 2/2 = 1	241	3					
The student is able to:							
. label models for halves, thirds, fourths.	243-	2					
. use > or < and = to compare fractional numbers with like denominators.	247	3-4					
. add fractions with like denominators: halves, thirds, fourths.	249-	3-4					
. subtract fractions with like denominators.	251	3-4					
The student values:							

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ____________

SMALL SCHOOL PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student knows fractional regions of a model: halves

State Goal	1,7, 9,10
District Goal	
Program Goal	1,3

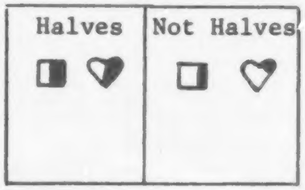
Related Area(s)

Suggested Activities: Grade(s) K

Title: Halves
Group Size: pairs
Materials: one 18"x24" chart, pictures drawn on cards showing two parts, some equal, some not equal

Procedure:
- Students place the cards in their proper place on the 18"x24" chart.

Chart



Suggested Monitoring Procedures

Mini-Test: "Halves"
Group Size: entire class
Materials: shape exercise, crayon

Procedure:
- Give each student a sheet with the following figures:

- Have students shade half of each figure.

Possible Resources

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel & Associates, Inc., 1973, pp. 24-25, 27

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) The student knows fractional regions of a model: halves, thirds, fourths.

Related Area(s)

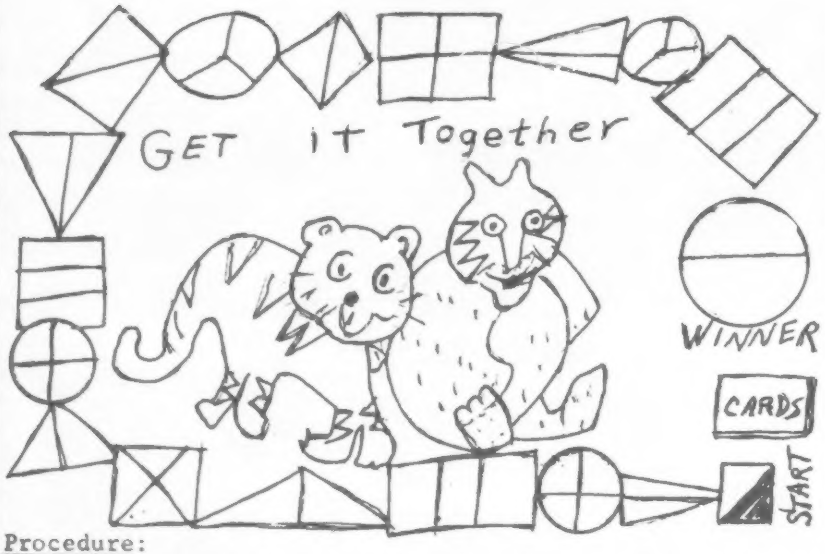
State Goal 1,7, 9,10

District Goal

Program Goal 1,3

Suggested Activities: Grade(s) K-1

Title: Get It Together
Group Size: small group
Materials: game board 17"x21", game cards 3"x5" with pictures (hand drawn or from old math workbooks), use geometric shapes for markers



Procedure:
- Teacher spreads cards out face down in a pile on the game board. Direct students to put markers at the start. In turn, each student selects a card and moves one space if it matches.

Suggested Monitoring Procedures

Teacher directs student to point to a model or a drawing of a fractional region as teacher says: "Show me the item that shows 1/2, 1/4, 1/3."

Mini-Test: "Matching Fractions"
Group Size: entire class
Materials: fraction exercise (as below)

Procedure:
- Ask students to match figures with symbols.

Possible Resources

Hamilton, Virginia and Fischer, Charlotte, The Fabric of Mathematics (A Resource Book for Teachers), Hillsborough, CA, 1972, Activity Resource Co., 197, pp. 30-33

District Resources

Suggested Activities: Grade(s) K-1

Suggested Monitoring Procedures

Possible Resources

Procedure:

- Teacher spreads cards out face down in a pile on the game board. Direct students to put markers at the start. In turn, each student selects a card and moves one space if it matches.
- If card does not match, student waits for next turn to select another card.
- All cards are put face down in a discard pile. This pile may be when original pile is depleted.

Variation:

- Change game to an activity and the student draws a card and places it over its matching shape.

District Resources

471

470

Suggested Objective Placement K-1

Student Learning Objective(s) The student knows fractional regions of a model: halves, thirds, fourths.

State Goal	1
District Goal	
Program Goal	1,3

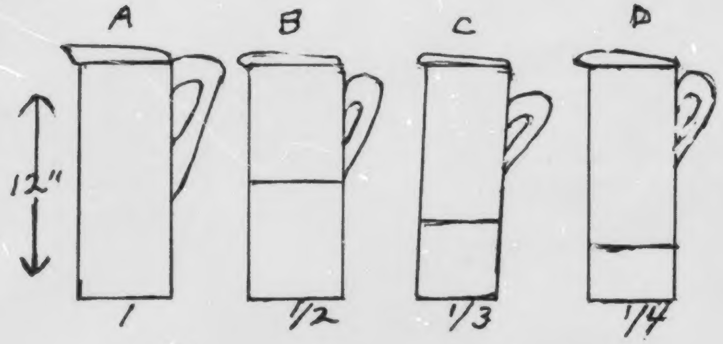
Related Area(s) Science

Suggested Activities: Grade(s) K-1	Suggested Monitoring Procedures	Possible Resources
		Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, pp. 195-197

Title: Pitcher Measuring
Group Size: large group or entire class
Materials: graph paper (1" square), worksheet with 4 pitchers drawn and marked a, b, c, d. (see diagram)

Procedure:

. Teacher directs students to cut a strip of graph paper 12 squares high. If students have trouble, teacher can cut 4 such strips for each student and pass them out with the worksheets.



District Resources

Suggested Activities: Grade(s) K-1	Suggested Monitoring Procedures	Possible Resources
. Teacher directs the students to put 1 strip with 12 squares in (paste on) pitcher "A". Then fold the next strip in half, cut and put the resulting 6 squares in pitcher "B". Fold next strip into thirds, cut and put in pitcher "C". . Finally, students take the last strip, fold and cut into fourths, or have them count and cut 3 squares and put into pitcher marked "D". Variation: . Pass out worksheets with 4 pitchers with fractional regions marked. Direct students to color the regions.		
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) The student knows the fractional parts 1/2, 1/3 and 1/4 when given a set or grouping.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,2,4

Related Area(s)

Suggested Activities: Grade(s) 1

Title: Pieces of Pie
Group Size: individual or small groups
Materials: ditto sheet with pies or circles divided into parts of 1/2, 1/3, 1/4, paper plates cut into 1/2, 1/3 or 1/4 and a complete (whole) paper plate, counters to nine for 1/3 groupings, counters to ten for 1/2 groupings, counters to eight for 1/4 groupings

Procedure:

- Teacher directs students to color one of the two pieces, one of the three pieces and one of the four pieces on the ditto sheet.
- Students show teacher one-half of the plate, then one-fourth and one-third of a plate.
- Direct students to separate counters into equal groups such as two groups, three groups, four groups and thus realize that the counters have been divided into 1/2, 1/3, 1/4.

Suggested Monitoring Procedures

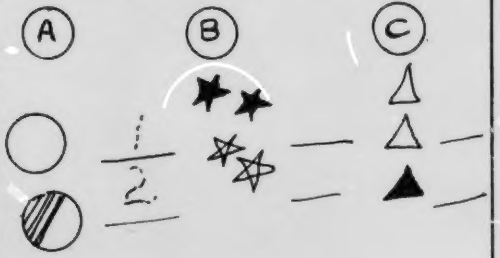
Student will orally identify the shaded fractional unit of different shapes divided into fractional parts of 1/2, 1/3 or 1/4 correctly.

The student will be able to identify counters grouped in 1/3, 1/2, 1/4 orally.

Mini-Test: "Write The Fraction"
Group Size: entire class
Materials: shape exercise as below

Procedure:

- Write the fraction for the shaded part of each set.



Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976. pp. 200-201

Suydam, Marilyn N., Classroom Ideas from Research on Computational Skills, National Council of Teachers of Mathematics, 1976, pp. 31-32

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOO[illegible] PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student knows the fractional parts 1/2, 1/4, 1/3, 2/3, 2/4, 3/4 when given a set or grouping.

State Goal 1,7, 9,10

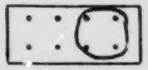
District Goal

Program Goal 1,2,5

Related Area(s)

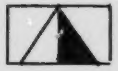
Suggested Activities: Grade(s) 2-3

Title: Fractions Picture Game
Group Size: small group--2 or 3 students
Materials: game board 17"x2", markers, game cards 3"x5" showing sets of objects with fractional part circled.

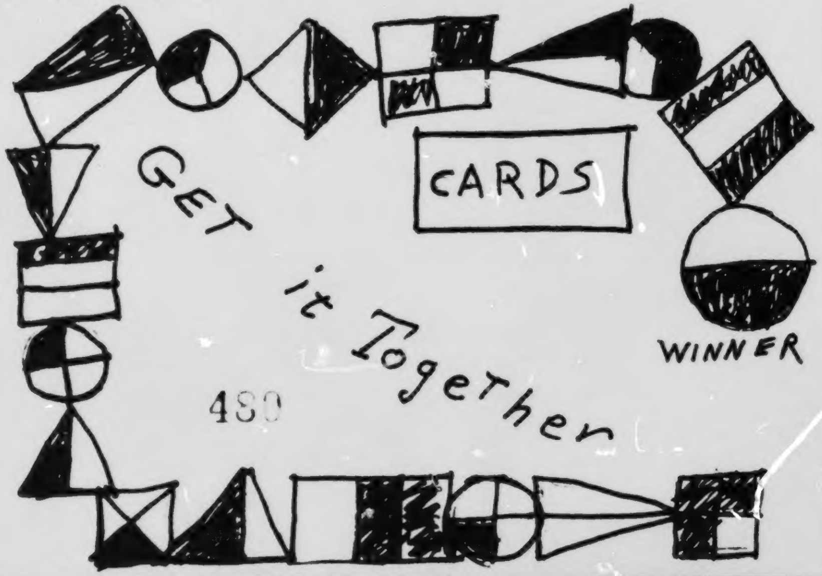


or a written fraction 1/2

or a shaded fractional part of an object.



Example playing board:



Suggested Monitoring Procedures

The student constructs and labels given models by halves, thirds or fourths on a written test or on a one-to-one basis with teacher.

Mini-Test: "Fractional Parts"
Group Size: entire class
Materials: fractional parts exercise (see below)
Procedure:
. Write the fraction for the shaded part of each set.

Possible Resources

Experiences in Mathematical Ideas, Vol. 1, National Council of Teachers of Mathematics, 1970, pp. 137 and 149

Henderson, George L., Let's Play Games in Mathematics Vol. 3, National Textbook Co., 1970, p. 21

District Resources

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
Procedure: . Teacher directs students as follows in order to match fractional parts of regions and sets of fractional numbers: A. Spread cards out face down. B. Teacher directs students to put a marker at start. C. Student selects a card and moves to the symbol represented by the card. D. Student to go around the board first wins.		
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student knows that a fraction having like denominator and numerator represents one. Example: 2/2 = 1

State Goal	1,7, 9,10
District Goal	
Program Goal	3,1

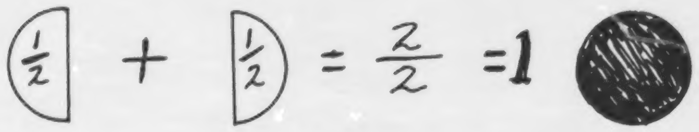
Related Area(s)

Suggested Activities: Grade(s) 3

Title: Shapes
Group Size: individual or small groups
Materials: colored construction paper, scissors, marking pens or crayons, paste, newsprint (large piece)

Procedure:

- Teacher instructs students to cut various shapes out of the construction paper (rectangles, circles, squares, etc.).
- Teacher directs each student to take one shape, mark and cut it into two equal parts.
- Student labels each half and pastes both pieces in number sentence form onto newsprint (see illustration).



- Student proceeds with other shapes, using 1/3, 1/4.

Suggested Monitoring Procedures

Teacher observes as student demonstrates how specific fractions make a whole.

Mini-Test: "One Whole"
Group Size: entire class
Materials: fraction exercise as below

Procedure:

- Circle fractions that represent one whole.

2/3 1/2 4/4 2/4 2/2

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 197

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) The student is able to label models for halves, thirds and fourths.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,2,5

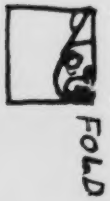
Related Area(s) Art

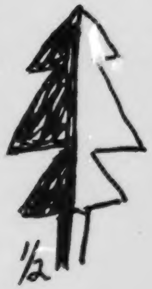
Suggested Activities: Grade(s) 2

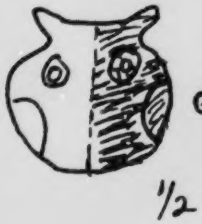
Title:
Group Size: entire class
Materials: construction paper--several 6"x6" and one large 18"x21", colors, scissors, pencil

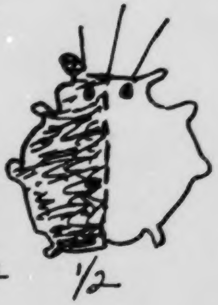
Procedure:

- Have the students fold a piece of construction paper in half. Now have the students draw a half of an object. Cut it out. Color only one-half of the object. Now label the colored part "1/2"?









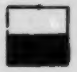
Suggested Monitoring Procedures

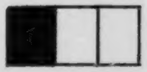
Given models of halves, thirds and fourths, the student can read and write the correct fractions.

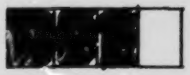
Mini-Test: "Identifying Models"
Group Size: entire class
Materials: exercise with fractional models to label

Procedure:

- Label the shaded part of each fractional unit.

 ___

 ___

 ___

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, p. 198

Kelley S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 27

Health Elementary Mathematics, Dilley-Rucker-Jackson

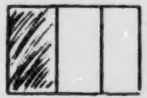
District Resources

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources

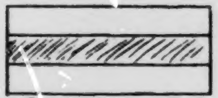
Title:
Group Size: entire class
Materials: cut squares, rectangles and/or circles about 4"x4", crayons

Procedure:

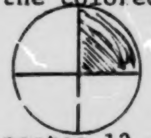
- Have students divide (by folding) a square or rectangle into thirds--3 equal parts. Have them color on one of the parts and ask for the fraction of the square that is colored.



- The fraction of the colored part is one-third.
- The paper could have been folded long ways and any one of the three areas be colored in.



- Divide into fourths. Color one part. The fraction of the colored part is one-fourth.



- The student pastes 12 of the best models he/she made on a 18"x21" construction paper in any order.
- The student now writes the fraction for each model.
- Have some students show their models and read the fractional part which is colored.
- Continue the activity having students color in the given fraction square.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2

Student Learning Objective(s)	The student is able to label models for halves, thirds and fourths.	State Goal	1,7, 9,10
		District Goal	
		Program Goal	1,2,5

Related Area(s) Art

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources
	Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, pp. 59-62	

Title: Make It - Divide It - Eat It

Group Size: Two, three or four

Materials: peanut butter, jelly, butter, knives, bread, paper towels, paper plates

Procedure:

- At a center the students make a peanut butter and jelly sandwich on a paper plate
- The students are to cut the sandwich into halves, thirds or fourths. When this has been done, the students can eat the equally divided sandwich.

Variations:

- The class could make a cake, cookies, etc. Then divide them equally among the class.

District Resources

492

493

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student is able to use < or > and = to compare fractional numbers with like denominators.

State Goal 1,7,9,10

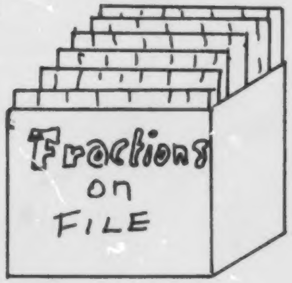
District Goal

Program Goal 1,2,5

Related Area(s)

Suggested Activities: Grade(s) 3

Title: Fractions on File
Group Size: individual
Materials: worksheets, file box for sheets -- teacher prepares several sheets of varying levels of difficulty (see diagram)



Teacher covers the pages with plastic and files them in order. Provide answer sheets so students may check own work.

Procedure:
- Teacher directs student to take a sheet and answer the questions by writing a number sentence below the diagram.
- Teacher directs student to check answers and proceed to more difficult fractions.

(See back for example.)

Suggested Monitoring Procedures

Teacher flashes card. Student responds orally by reading the number sentence, including "greater than", "less than" or "equal to".

Examples of flash cards:

Mini-Test: "Comparing Fractions"
Group Size: entire class
Materials: fraction exercise as below

Procedure:
. Compare. Use < or >.

3/4 1/3	2/3 2/4
1/2 1/3	1/4 1/3

Possible Resources

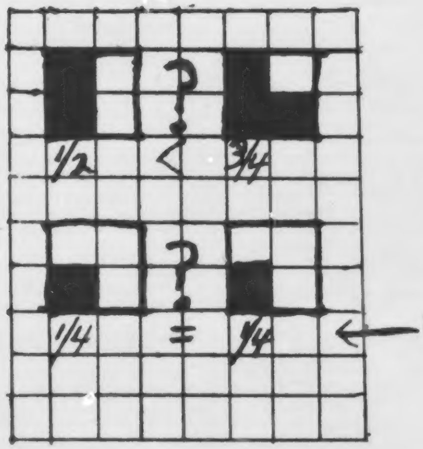
Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, p. 25

District Resources

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources

(Cards will wipe clean for re-use)

Example:



Student answer

District Resources

493

493

SMALL SCHOO PROJECT

Suggested Objective Placement 3-3

Student Learning Objective(s) The student is able to add fractions with like denominators.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,2, 3,7

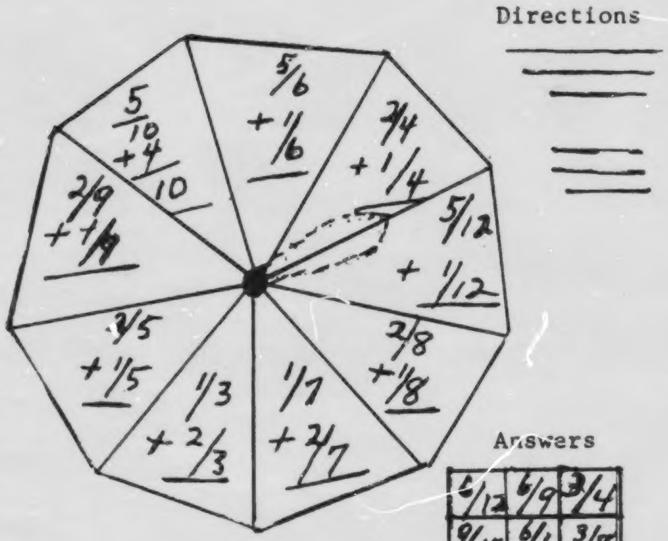
Related Area(s)

Suggested Activities: Grade(s) 3

Title: Spin the Spinner

Group Size: individual or partners

Materials: Use the diagram as a model to make a gameboard 8"x12". Write in the problems and answers. Laminate. (Make several as you will want to put different problems on each. Make a spinner from laminated paper and place in the center of the board.)



Answers

5/12	6/9	3/4
9/10	6/6	3/8
3/7	3/5	3/3

Spinner

Suggested Monitoring Procedures

Mini-Test: "Adding Like Frac Fractions:

Group Size: entire class

Materials: fraction exercise as below

Procedure:

. Add: $\begin{array}{r} 3/5 \\ \underline{+1/5} \end{array}$ $\begin{array}{r} 1/3 \\ \underline{+1/3} \end{array}$

Possible Resources

Reisman, Fredricka K., A Guide to the Diagnostic Teaching of Arithmetic, Charles E. Merrill Publishing Co., 1972, p. 96

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 208-210

District Resources

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources
Procedure: . Teacher directs students to use a crayon to write answers to the problems. . Student spins spinner and writes answer to the problem to which the spinner points. . Student then finds the answer in the box (see diagram), and crosses it out with the crayon. . Continue until student has three in a row crossed out, or . Play alone and cross out all the answers.		
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student is able to subtract fractions with like denominators.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,2, 3,6

Related Area(s)

Suggested Activities: Grade(s) 3

Title: Carton Calculators
Group Size: individual or small groups
Materials: decorated egg cartons, plastic covered problem sheets, small bag of beans

Procedure:

- Teacher pastes directions inside the cover of the egg cartons.
- Teacher demonstrates how the egg carton can be used to solve problems with denominators of 1, 2, 3, 4, 6 or 12. For addends or sums greater than 1, use two cartons.
- Teacher directs student to fill the number of sections representing the first fraction and subtract the number represented by the second fraction. Student then counts what remains in the carton.

Variation:

- Teacher can cut apart cartons to represent 1/2, 1/3, etc. Example: Cut 1/2 and color red; cut 1/4 and color blue. Fit these sections, one on top of another, into whole egg carton--colors will show different fractional parts in relation to whole. In this way, teacher can aid student in visualizing the egg carton as a whole, halves, thirds, fourths, sixths, twelves.

Suggested Monitoring Procedures

Paper-pencil test.

Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 214-216.

Kennedy, Leonard M., Models for Mathematics in the Elementary School, Wadsworth Publishing Co., 1967, p. 184

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

SUBJECT: **Mathematics**

SPECIFIC AREA: Geometry

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. the positional terms, i.e., left, right, top, bottom, in front of, behind, below, next to, on, above, middle, between, inside and outside.	257	K-1					
. the term "line segment" refers to part of a line and has two endpoints.	259	2-3					
. a line segment is named by its endpoints.	259	2-3					
. a pentagon is a closed shape with five sides.	261	3					
. a hexagon is a closed shape with six sides.	261	3					
. an octagon is a closed shape with eight sides.	261	3					
. the radius is a line segment from the center of a circle to a point on the circle.	263	3-4					
. the diameter is a line segment that goes from one side of a circle to another and passes through the center.	263	3-4					
The student is able to:							
*. identify geometric shapes: square, circle, triangle and rectangle.	265	K					
*. locate positions, i.e., left, right, top, bottom, in front of, behind, below, next to, on, above, middle, inside and outside.	257	K-1					
. identify congruent shapes, i.e., circles, squares, rectangles, triangles.	267	K-1					
. identify the left side and right side of objects.	257	K-1					
. use a straightedge to draw line segments to form recognizable shapes: square, rectangle and triangle.	269	2-3					
. name a line segment by its endpoints.	259	2-3					
. identify an angle and a right angle.	255	2-3					
. put a radius or diameter on a circle.	263	3-4					
The student values:							

503

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOOL[illegible]ROJECT

Suggested Objective Placement 3

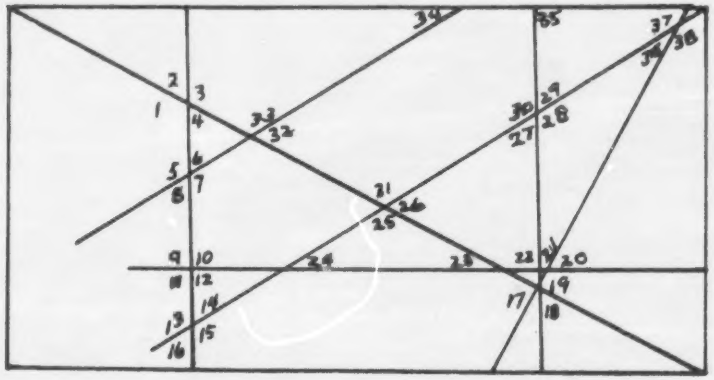
Student Learning Objective(s) The student is able to identify an angle and a right angle.

State Goal	1,10
District Goal	
Program Goal	

Related Area(s) Physical Education (sit ups = right angle; flat = 180° angle)

Suggested Activities: Grade(s) 3

Title:	Angleboard
Group Size:	entire class
Materials:	large bulletin board, yarn, colored string or tape, numbers



Procedure:

- . Make a large line design with several parallel and intersecting lines. Use yarn, colored string or tape to form the lines. Use a number to label each angle forward.
- . Have students make individual charts on which they classify the angles by number. Have them designate which angles are right angles or not right angles.

Suggested Monitoring Procedures

Teacher observes students identifying angles.

Possible Resources

May, Lola J., Teaching Mathematics in the Elementary School, New York: The Free Press, 1970, pp. 253-257

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) A. The student knows the positional terms: left, right, top, bottom, in front of, behind, below, next to, on, above, middle, between, inside, outside. B. The student is able to locate positions: left, right, top, bottom, in front of, behind, below, next to, on, above, middle, inside, outside. C. The student is able to identify the left and right side of objects.

State Goal ☐
District Goal ☐
Program Goal ☐

Related Area(s) Reading

Suggested Activities: Grade(s) K-1

Title: Left and Right
Group Size: entire class
Materials: paint, paper, crayons

Procedure:

- Teacher directs students to make their own hand drawing on a piece of paper.
- Students label the left and right hand and keep the drawings in their desks for reference.
- Teacher directs students to lie on the floor on a large piece of paper or an old sheet, one at a time.
- Teacher traces around the student's body with a crayon.
- The students then draw in eyes, nose, mouth, clothing, etc.
- Teacher discusses with class the positions of the parts of the body and asks students to identify the right eye, left arm, etc.

Title: Right Hand, Left Hand (finger play)
Group Size: entire class
Materials: self

Procedure:

- Follow actions as rhyme indicates:

Right Hand, Left Hand

This is my right hand,
I'll raise it up high.
This is my left hand.
I'll touch the sky.

Right hand, left hand
Roll them around.
Left hand, right hand.
Pound, pound, pound.

Suggested Monitoring Procedures

Mini-Test: "Positional Words"
Group Size: entire class
Materials: diagram (see below)
Procedure:

- Each student is given a diagram

7 5 A B C
2

- Each student records answers to the following questions:
  What number is above the straight line?________
  What letter is to the right of "b"?________
  What letter is between "a" and "c"?________

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, p. 62, p.111

District Resources

Suggested Activities: Grade(s) K-1

Title: Top, Bottom, Middle
Group Size: individuals or entire class
Materials: flannel board, yarn, felt cutouts

Procedure:

. Teacher divides flannel board in two parts with a piece of yarn, horizontally.
. Teacher asks a student to point to the top of the board and to the bottom.
. Teacher distributes a variety of felt cutouts to students and asks them to take turns placing them on the top or the bottom of the flannel board.
. Teacher then takes two pieces of yarn and marks off three parts, horizontally.
. Modify the above activity to include the middle position, as well as the top and bottom.

Title: On, Above, Below
Group Size: large group
Materials: pencil

Procedure:

. Teacher asks students to sit by their desks with a pencil. Ask students to place the pencil on the desk; hold it above the desk; hold it below the desk.

Title: Next To Or Between
Group Size: large group
Materials: variety of objects

Procedure:

. Direct students to stand next to a desk, a door, another student, etc.
. Teacher directs students to place an item next to something.
. Direct students to place an object between two other objects.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student knows a line segment is part of a line and has two endpoints. B. The student knows a line segment is named by its endpoints. C. The student is able to name a line segment by its endpoints.

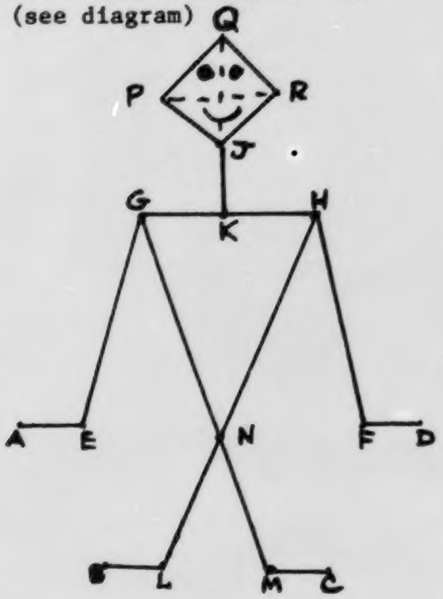
State Goal	1, 10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

After students have developed the concept that a line segment is named by its endpoints, have them do the following activity.

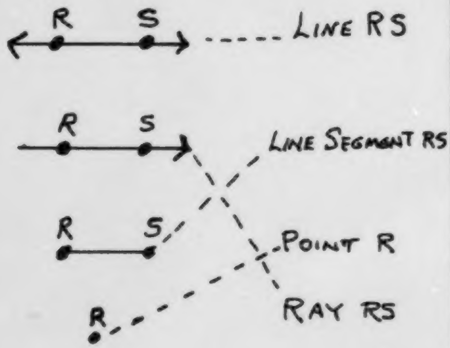
Title: Name the Segments
Group Size: individuals
Materials: a worksheet with lines and label points (see diagram)



Note: Be sure it is clear the figure is facing you.

Suggested Monitoring Procedures

Mini-Test: "Match Figures and Names"
Group Size: entire class
Materials: figures and names drawing as below
Procedure:
. Each student is asked to match figures and names.



Possible Resources

L.A.P. L-00051-P (from ESD 109 Instructional Materials Center)

Kelley, S. Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 47

Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, pp. 16-17

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 306

District Resources

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

Procedure:

- Have students answer the following questions about the line segment drawing of the man.
  1. What line segment names his left shoulder? (KH)
  2. What line segment names his right shoulder? (NL)
  3. What line segment names his left foot? (MC)
  4. What line segment names his right arm? (GE)
  5. What line segment names his neck? (JK)
  6. What line segments name his head? (PQ, QR, RJ, JP)

Variation:

- Have the points labeled and have students connect the endpoints.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

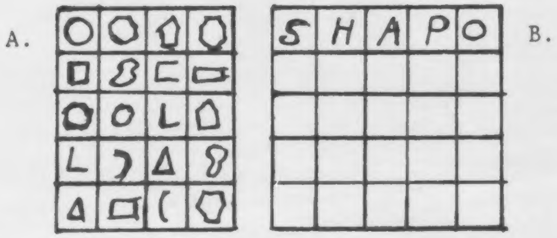
Student Learning Objective(s) A. The student knows a pentagon is a closed shape with five sides. B. The student knows a hexagon is a closed shape with six sides. C. The student knows an octagon is a closed shape with eight sides.

State Goal	1, 10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3

Title:	Shapo
Group Size:	entire class
Materials:	two dittos similar to those illustrated below, markers (beans, etc.0, teacher-made set of small calling cards (2 of each) for game. On each card write a label for one of the figures shown. Need a master list for all combinations listed.



Under S pentagon	Under H circle	Under P pentagon
hexagon octagon triangle	square right angle rectangle	curve closed curve

Suggested Monitoring Procedures

Hold up shapes and ask students to name them orally.

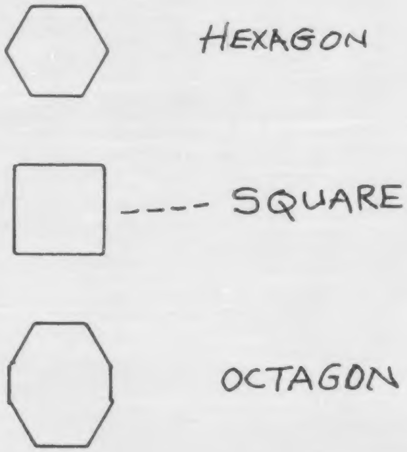
Mini-Test: "Matching Shapes With Word Names"

Group Size: entire class

Materials: "shapes and names" picture

Procedure:

. Each student is asked to match word name with shape



Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 307-309

District Resources

Suggested Activities: Grade(s) 3	Suggested Monitoring Procedures	Possible Resources

Procedure:

- Students cut apart the squares on sheet A and paste them on sheet B in any arrangement.
- Each student will need to cut small pieces of paper for markers (or use beans, marbles).
- Each student uses the SHAPO card he/she has made and plays the game.
- Teacher or student reads out the name of the shape. Student ocvers the shape with marker.
- The first player to get four down, or five across or diagonally, or four corners, wins. Player must yell out "SHAPO"!
- Note: Make the game easier or more difficult by varying figures used.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) A. The student knows the radius is a line segment from the center of a circle to a point on the circle. B. The student knows that the diameter is a line segment that goes from one side of a circle to the other and through the center. C. The student is able to put a radius or diameter on a circle.

State Goal	1, 10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 3-4

Title: Circle Center
Group Size: large group
Materials: worksheets with large and small circles drawn on them (at least one sheet per student), pencil

Procedure:

- Have students cut out the circles and find the center by folding each circle in fourths. The center is where the folds meet.
- Discuss with students the following: The fold from the center to the edge is the radius and the fold that goes all the way across is the diameter.

Title: Radius and Diameter
Group Size: large group
Materials: worksheets with circles in which the radius and diameter are shown, pencils.

Procedure:

- Distribute worksheets to the students. Have students point out the radii and diameters as they are marked on the circles.

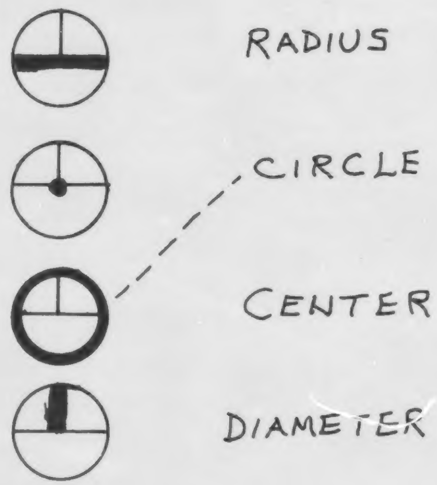
Suggested Monitoring Procedures

Check the worksheets. Give a test sheet with several circles drawn on them. Have students draw in the radius or diameter of the circles.

Mini-Test: "Circle Names"
Group Size: entire class
Materials: circle exercise (as below)

Procedure:

- Match the picture with the words.



Possible Resources

D'Augustine, Charles, *Multiple Methods of Teaching Mathematics in the Elementary School*, Harper and Row, 1973, pp. 310-311

District Resources

Suggested Activities: Grade(s) 3-4	Suggested Monitoring Procedures	Possible Resources

Title: More Circles
Group Size: large group
Materials: worksheets with circles on them and with the centers of the circles marked, pencils

Procedure:
- Teacher distributes worksheets to students.
- Have students draw the diameter and radii on the circles, starting at the center mark.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K

Student Learning Objective(s) The student is able to identify geometric shapes: square, circle, triangle and rectangle.

State Goal	1, 10
District Goal	
Program Goal	

Related Area(s) Environmental Education, Reading

Suggested Activities: Grade(s) K

Title:	Shape Walk
Group Size:	entire class
Materials:	various materials (see below) experience chart

Procedure:

- Take students on a "shape walk". Encourage them to notice the different kinds of shapes of things in their environment.
- Have students list on experience chart the objects and their shapes seen on the walk.
- Have students draw pictures of things seen on the walk.
- Teacher passes out various materials to students and asks them to see how many different ways they can make shapes.

Title:	Shapes
Group Size:	entire class
Materials:	various materials

Procedure:

- Teacher passes out various materials and lets students make as many shapes as possible from them.

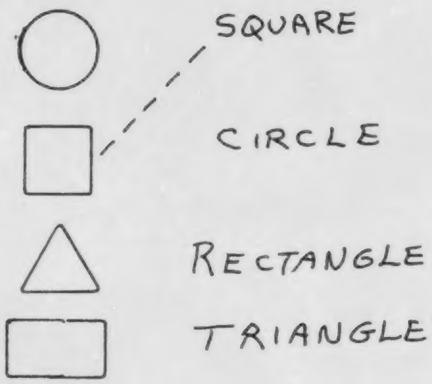
Suggested Monitoring Procedures

Teacher has a model of the four shapes. Teacher points to each one as the student identifies it by name.

Mini-Test:	"Match Geometric Shapes and Word Names:
Group Size:	entire class
Materials:	shape exercise as below

Procedure:

- Ask each student to match geometric shapes and word names.



Possible Resources

L.A.P. L-02012-P from ESD 109 IMC

Kelley, Jeanne S., Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, pp. 45-46

Henderson, George L., Let's Play Games in Mathematics, Vol. 3, National Textbook Co., 1970, pp. 23-24

District Resources

Suggested Activities: Grade(s) K

Title: Shape Lunch
Group Size: small or large groups
Materials: luncheon food (cottage cheese, lunch meats, cheese, bread or biscuit dough, cookie cutters, knives, rolling pin, paper plates, popsicle sticks, ice cube trays, fruit juice

Procedure:

- Have a small group of students roll out biscuit dough and use the flat shapes to cut the dough.
- Give another group dull knives and suggest they cut cheese and luncheon meat into circles, squares, triangles and rectangles.
- Teacher places a scoop of cottage cheese on each plate, noting that the scoop is in the shape of a circle.
- Have part of the class prepare popsicles in ice cube trays for dessert.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) The student is able to identify congruent shapes: circles, squares, rectangles, triangles.

Related Area(s)

State Goal	1, 10
District Goal	
Program Goal	

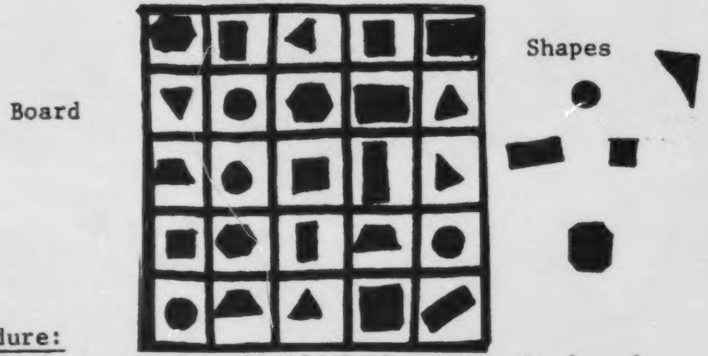
Suggested Activities: Grade(s) 1

Title:
Group Size: small group
Materials: Cuisenaire rods or shapes out of paper or attribute blocks

Procedure:

. Students are given a variety of rods or shapes or attribute blocks. Students then match the shapes that are congruent (same size and shape).

Title: Match the Shapes
Group Size: individuals
Materials: 15"x15" playing board divided into 25 squares, shapes to match those on the playing board



Procedure:

. Students match individual shapes to the board shapes.

Suggested Monitoring Procedures

Give students a paper with rows of shapes. They are to mark (by color or an X) the one that looks like the first in the row.

Possible Resources

Henderson, George L., Let's Play Games in Mathematics, Vol. 2, National Textbook Co., 1970, pp. 42-43, 64-65

Kelley, S., Jeanne, Learning Mathematics Through Activities, James E. Freel and Associates, Inc., 1973, p. 46

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student is able to use a straightedge to draw line segments to form recognizable shapes: square, rectangle, triangle.

State Goal	1, 10
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Line Segments
Group Size: large group
Materials: ruler

Procedure:

- Assuming students know what a line segment is and what a square, rectangle and triangle are, have them use the ruler to draw these geometric figures. Give them samples of each on a worksheet and have students trace the shapes with their rulers.
- Students then draw their own geometric figures using graph paper and then later using plain paper.

Suggested Monitoring Procedures

Mini-Test: "Drawing Shapes"
Group Size: entire class
Materials: paper and pencil, ruler

Procedure:

- Ask students to draw line segments to form a square, rectangle and circle. Label figures.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart, Winston, 1970, pp. 347-348

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

SUBJECT: Mathematics

SPECIFIC AREA: Graphs

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. a picture graph (pictograph) is a visual representation of a set of data where each picture represents an object.	275	K-1					
a. graphs which deal with whole numbers	275	K-3					
b. graphs where picture represents other than whole numbers		4-6					
. a bar graph is a visual representation of a set of data where one unit may represent 1, 2, 5 or 10 items.	281	2-3					
. a line graph represents data by specific points on a grid, the points being joined by lines to form a visual representation (or pattern).	283	2-4					
. an ordered pair of numbers identifies a point on a grid.		5-6					
. a double bar graph compares two sets of data.		5-6					
. a circle graph shows information in terms of percentage of a fraction of the whole.		6-7					
. a table is a collection of data displayed in a specific order according to its variables.		5-8					
. a vertical axis is the vertical line along which a coordinate is measured.		5-6					
. a horizontal axis is the horizontal line along which a coordinate is measured.		5-6					
. coordinates are sets of numbers used to locate a point in space (4, 3), (2, 1).		5-6					
The student is able to:							
. read and construct a picture graph (pictograph) from given and/or collected data (whole numbers).	273	K-3					
. read and construct a picture graph (pictograph) from given and/or collected data (whole numbers and fractional parts).		4-6					
. collect data.	273	2-4					
. order or rank collected data in the form of a table.		5-8					
. plot data from tables.		5-8					
*. read and interpret data on a simple bar graph.	277-	2-4					
. read and interpret data on a multiple bar graph.		5-7					
*. construct a bar graph from given data or from collected data.	277-	3-4					
. construct a multiple bar graph from given data or from collected data.		5-6					
*. construct a single line graph from given data or from collected data.		4-5					
. construct a multiple line graph from given data or from collected data.		6-8					
. read and interpret data on a circle graph.		6-7					
. construct a circle graph from given data or collected data.		6-7					
The student values:							

513

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ________

SMALL SCHOOLS PROJECT

Suggested Objective Placement K-3

Student Learning Objective(s) A. The student is able to read and construct a picture graph (pictograph) from given and/or collected data (whole numbers). B. The student is able to collect data.

State Goal	☐
District Goal	☐
Program Goal	☐

Related Area(s)

Suggested Activities: Grade(s) K-1	Suggested Monitoring Procedures	Possible Resources
Title: Birthdays Group Size: entire class Materials: graph paper, crayons		Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 13-56

Procedure:

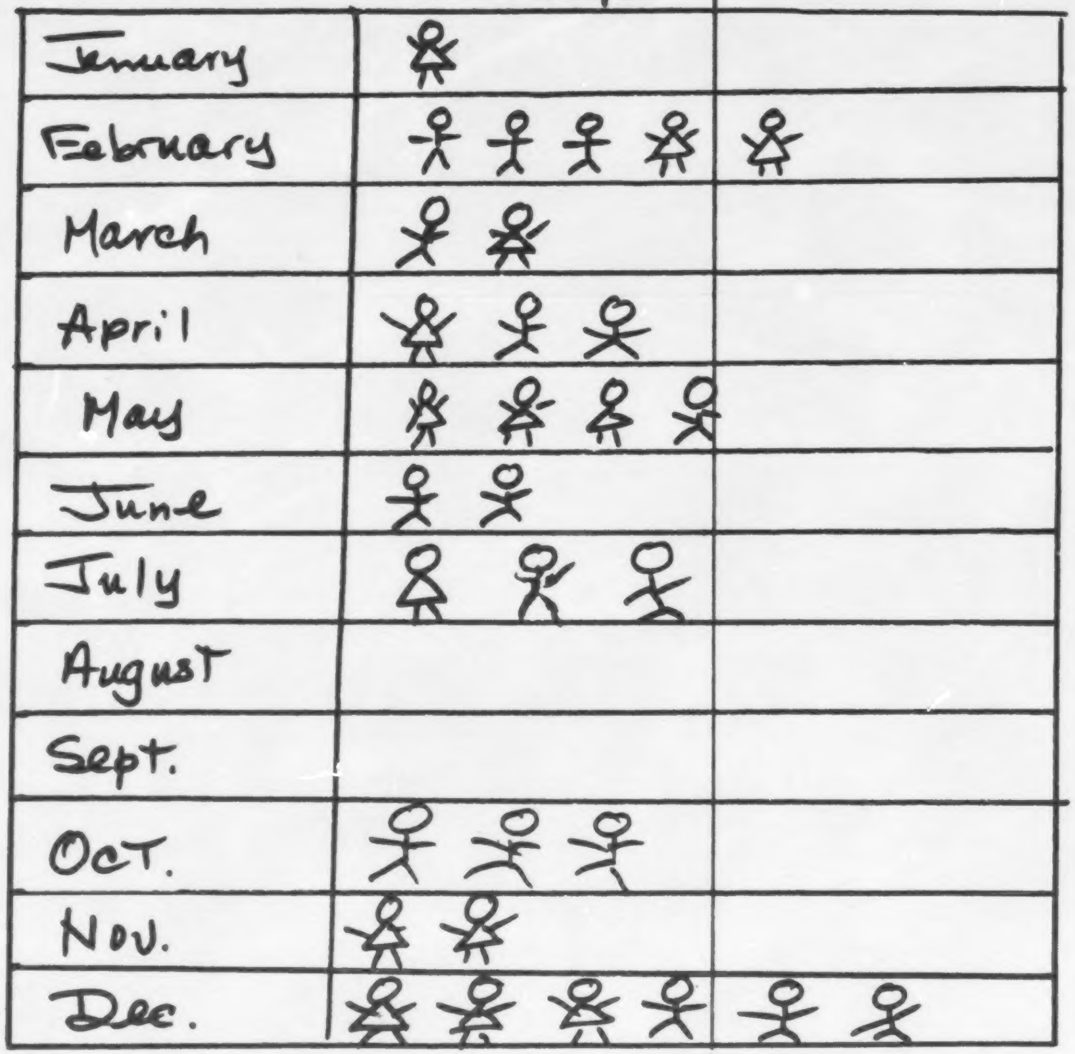
- Teacher and students develop the birthday graph (see back page).
- Teacher asks:
  1. In what months were there no birthdays?
  2. In what months were there only one birthday?
  3. In what months were there three birthdays?
  4. In what month were the most birthdays?
  5. In what month did only one girl have a birthday?
  6. In what month did only one girl and one boy have a birthday?
  7. In what month did only boys have birthdays?
  8. And so on...

See illustration on Page 274.

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources

Birthdays



Students draw themselves opposite the correct months.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) The student knows a picture graph (pictograph) is a visual representation where each picture represents an object.

State Goal ☐

District Goal ☐

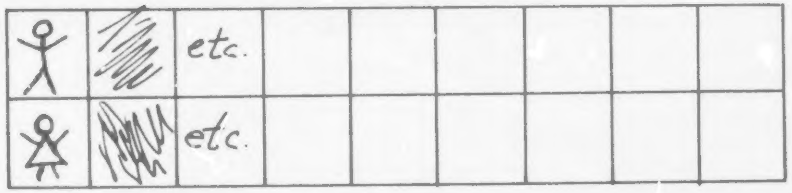
Program Goal ☐

Related Area(s) Graphs which deal with whole numbers

Suggested Activities: Grade(s) ______

Title: Brothers and Sisters
Group Size: entire class
Materials: graphing paper, children, crayons

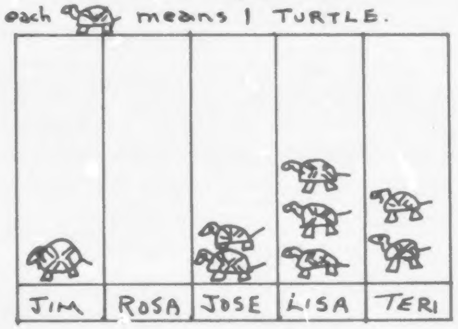
Procedure:
- Discuss members of the family, especially brothers and sisters.
- When everyone seems certain of the correct number, then they can indicate the number of each on the graph by coloring one square for each brother and sister.
- An extension of the above is to have the class determine how many brothers or sisters are older or younger.



Suggested Monitoring Procedures

Mini-Test: "Pictograph"
Group Size: entire class
Materials: pictograph as shown below for each student

Procedure:
- Teacher reads all word names and questions to the class.
- Each students records his/her answers to the questions.



Who had the most turtles?________
Who had no turtle?________
Who had the same number of turtles?_______ and __________

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 268

Baratta-Lorton, Mary, Workjobs, Addison-Wesley, 1922, pp. 222-223

Lovell, Kenneth, The Growth of Understanding in Mathematics, Holt, Rinehart and Winston, 1971, pp. 157-159

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 13-56, 138-144

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 148-151

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement ______

Student Learning Objective(s) A. The student is able to read and interpret data on a simple bar graph. B. The student is able to construct a bar graph from given data or from collected data.

State Goal	☐
District Goal	☐
Program Goal	☐

Related Area(s) ______

Suggested Activities: Grade(s) ______

Title: Pets in the Family
Group Size: entire class
Materials: large prepared graph as below:

	1	2	3	4	5
John			✓		
Claire			✓		
Tilly	✓				
Melba					✓
Tony				✓	

Procedure:

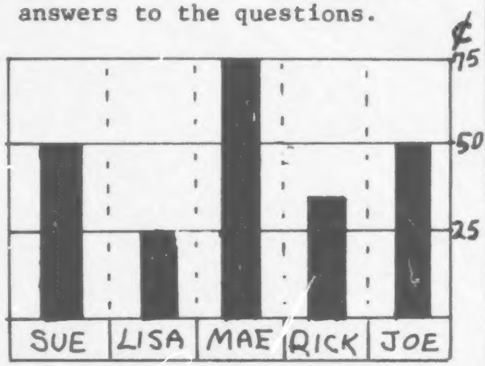
. Teacher asks:
1. How many pets in Tilly's family?
2. What families have three pets?
3. Whose family has the most pets?
4. How many families have one pet?

Suggested Monitoring Procedures

Mini-Test: "Bar Graph"
Group Size: entire class
Materials: bar graph as shown below

Procedure:

. Teacher reads all the word names and questions to the class.
. Each student records his/her answers to the questions.



Who spent 25¢?______
How many spent 50¢?______
How much did Mae spend?______
Who spent the most money?______

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 268

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-4

Student Learning Objective(s) A. The student is able to read and interpret simple data on a simple bar graph. B. The student is able to construct a bar graph from given data or from collected data.

State Goal 1, 10

District Goal

Program Goal

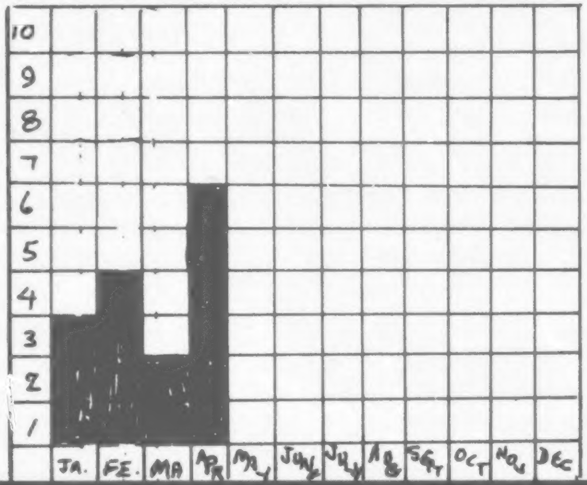
Related Area(s) Science, Social Studies

Suggested Activities: Grade(s) 2-4

Title: Birthday Graph
Group Size: entire class
Materials: record sheet, graph paper with 1/2" squares, crayons, colored pencils or felt tip pens, student folders or other record of student's birthday

Procedure:

- Teacher lists the 12 months on the record sheet.
- Teacher asks students their birthday month.
- Teacher records by grouping students' names according to their birthday months.
- Constructing the graph: Using the long side as the bottom of the graph paper, put the scale for the number of students having a birthday per month on the left side; put the months of the year across the bottom, spacing evenly across the page.



Suggested Monitoring Procedures

Teacher gives students bar graph together with questions about the interpretation of the graph. Number of correct answers indicates ability to interpret graph.

Teacher gives students a set of data and a blank sheet of graph paper. Instruct students to construct a bar graph using given data. Check for correctness (compare with a model graph).

Teacher gives students a topic for a graph (e.g., numbers of different reading books in the room). Ask students to collect data and make graph. Compare with model graph for accuracy.

Post a bar graph with some "high interest" information in a convenient place. Observe which students take time to examine the graph and which do not.

Possible Resources

Schminke, C. W., Teaching the Child Mathematics, The Dryden Press, Inc., 1973

District Resources

Suggested Activities: Grade(s) 2-4	Suggested Monitoring Procedures	Possible Resources

- Construct the bars for the graph either by:
  - (a) Writing the name in squares above the month (1 square per name), lightly coloring those squares with name in them, or,
  - (b) Coloring one square for each student who has a birthday in a given month.

Variation:

- For additional practice, students can construct another graph, ordering the months from the most number of birthdays to the least number of birthdays or vice-versa.
- Other ideas for graphing:
  Number of students having different hair color.
  Number of students having different color eyes.
  Number of cars of different make or color in teachers' parking lot.
  Number of books read by students in a month.
  Number of one-syllable, two-syllable or three-syllable words on a page.
  Pets.
  Game scores.
  Time spent during silent reading, etc.

Title: Pet Graph
Group Size: large group
Materials: flannel board, small colored flannel-board squares, animal cutouts, yarn

Procedure:

- Teacher makes four columns on a flannel board using yarn (one column may represent each pet).
- Place one animal cutout at the top of each column.
- Teacher has available a supply of flannel squares of different colors. Teacher directs students to put a square in the column of the pet they have.

Students make a picture graph of the days they are present in school.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) The student knows a bar graph is a visual representation of a set of data where one unit may represent 1, 2, 5 or 10 items.

State Goal ☐
District Goal ☐
Program Goal ☐

Related Area(s) ________

Suggested Activities: Grade(s) ______

Title: Children in the Family
Group Size: small group
Materials: large graph, crayons

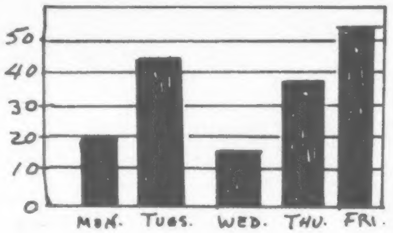
Procedure:
- . Teacher constructs graphs and writes in names of student.
- . Record on graph by crayoning one box for each
- . brother and sister.
- . Students then fill in bars on the graph.

	1	2	3	4	5
Teresa		✓			
Chico	✓				
Tom		✓			
Yint				✓	
Mary					✓

Suggested Monitoring Procedures

Mini-Test: "Circulation"
Group Size: entire class
Materials: bar graph as shown below

Procedure:
- . Teacher reads all the word names and questions to the class.
- . Each student records his/her answers.



Most books were checked out on?____________

Fewest books were checked out on?____________

20 books were checked out on?____________

44 books were checked out on?____________

Possible Resources

Pagne, Joseph N. (editor), Mathematics Learning in Early Childhood, National Council of Teachers of Mathematics, 1976, p. 268

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, p. 160

Baratta-Lorton, Mary, Mathematics Their Way, Addison-Wesley, 1976, pp. 162-163

District Resources

Suggested Activities: Grade(s) ______	• Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-4

Student Learning Objective(s) The student knows a line graph represents data by specific points on a grid, the points being joined by lines to form a visual representation (or pattern).

State Goal ☐
District Goal ☐
Program Goal ☐

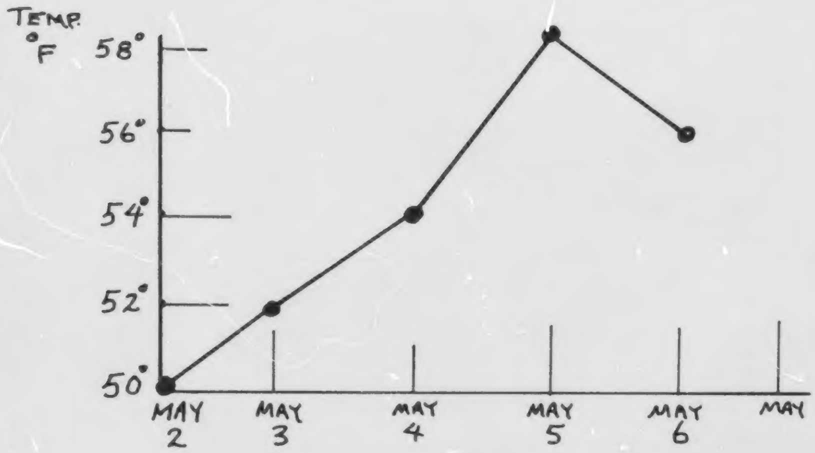
Related Area(s)

Suggested Activities: Grade(s) 2-4

Title: Temperature May 2-6
Group Size: entire class
Materials: large graph paper

Procedure:

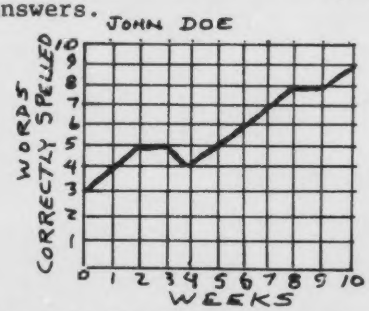
- Teacher and students construct a line graph recording the temperature at 10:00 a.m. each day for a week in May.



Suggested Monitoring Procedures

Mini-Test: "Line Graph"
Group Size: entire class
Materials: line graph as below
Procedure:

- Teacher reads all the word names and questions to the class.
- Each student records his/her answers.



What week did John do best in spelling?______________

How many words did John get right in week #5?______________

In what week did John go down in spelling?______________

Possible Resources

Lovell, Kenneth, The Growth of Understanding in Mathematics, Holt, Rinehart and Winston, 1971, pp. 161-162

Schmincke, C. W., Teaching the Child Mathematics, The Dryden Press, Inc., 1973, pp. 209-211

District Resources

Suggested Activities: Grade(s) 2-4

- Temperature is represented by a dot each day.
- Join all dots with lines on May 6.
- Ask students: (May 6)
  1. On what day was it the coolest?
  2. On what day was it the warmest?
  3. On what day was the temperature at 54°F?
  4. and so on

Suggested Monitoring Procedures

Possible Resources

District Resources

508

509

SUBJECT: Mathematics

SPECIFIC AREA: Measurement: Time

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4
The student knows:							
. the names of the days of the week.	287	K-1					
. the names of the months.	289	1-2					
. the names of the months in sequence.	291	1-2					
. the short hand of the clock is the hour hand.	293	2					
. the long hand of the clock is the minute hand.	293	2					
. the term "minute" refers to a unit of time measurement.	295	2					
. the term "hour" refers to a unit of time equal to 60 minutes.	295	2					
The student is able to:							
*. tell time to the hour.	297	1-2					
*. tell time to the half hour.	297	1-2					
tell time to the quarter hour.	305	2-3					
*. tell time by 5-minute intervals.	307	3-4					
*. write time in notation, i.e., 12:00, 12:30, 12:15, 12:55.	309	1-4					
The student values:							
. estimation as a useful skill in time measurement.	311	K-3					

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOOLS PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) The student knows the names of the days of the week.

State Goal 1,2,7
District Goal
Program Goal

Related Area(s) Language Arts

Suggested Activities: Grade(s) K-1

Title: My Week Booklet
Group Size: entire class
Materials: dittoed 9"x12" construction paper with names of the week printed on the top, paint or crayons

Procedure:

- Students make a "My Week" booklet by illustrating what they did on each day of the week. (Or student can write simple sentences describing what they did.)

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	My Week

Suggested Monitoring Procedures

Teacher observation: Observe student participation.

Mini-Test: "Days of the Week"
Group Size: one student
Procedure:

- Student names days of the week from Sunday through Saturday.

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 166-167

District Resources

Suggested Activities: Grade(s) K-1

Title: Days of the Week
Group Size: entire class
Materials: 9"x12" construction paper, one for each day of the week (day printed on the top)

Procedure:

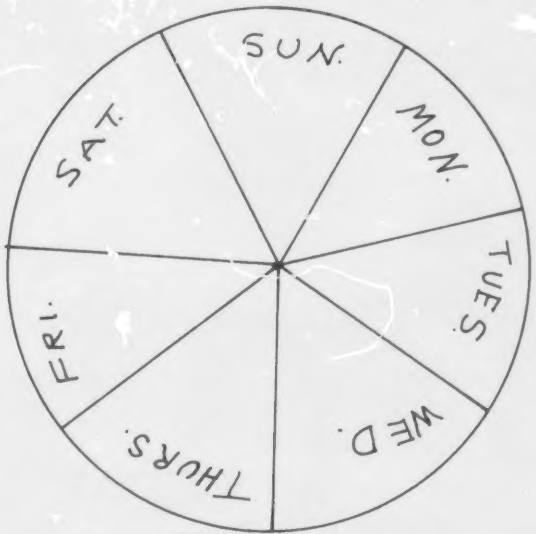
- Display on bulletin board the days of the week cards in a circle to illustrate the repeating cycle of the days. Label each day with pictures illustrating what happens in the classroom on that day.

Example:

- Monday--P.E.; Tuesday--music; Wednesday--library, etc.

Variation:

- Assign students' names on a week wheel for classroom jobs.



Suggested Monitoring Procedures

Teacher observation of student participation.

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) The student knows the names of the months.

State Goal 1,2,7

District Goal

Program Goal

Related Area(s) Language Arts, Social Studies

Suggested Activities: Grade(s) K-1

Title: Calendar
Group Size: large group
Materials: one blank dittoed calendar for each student, black crayons, one large calendar

Procedure:

- Teacher places a large monthly calendar in view.
- Teacher directs students to fill in the blank ditto.
- Students circle special days such as holidays, birthdays, etc., and indicate on the right hand side of the calendar what the special day is, e.g., field trip, music concert, birthday, etc.

NAME OF THE MONTH JUNE							
SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.	SPECIAL DAYS
		1	2	3	4	5	8-BIRTHDAY
6	7	⑧	9	10	11	12	20-FATHER'S DAY
13	14	15	16	17	18	19	
⑳	21	22	23	24	25	26	
27	28	29	30				

Suggested Monitoring Procedures

Students can orally name the months of the year.

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 168-169

District Resources

Suggested Activities: Grade(s) K-1

Suggested Monitoring Procedures

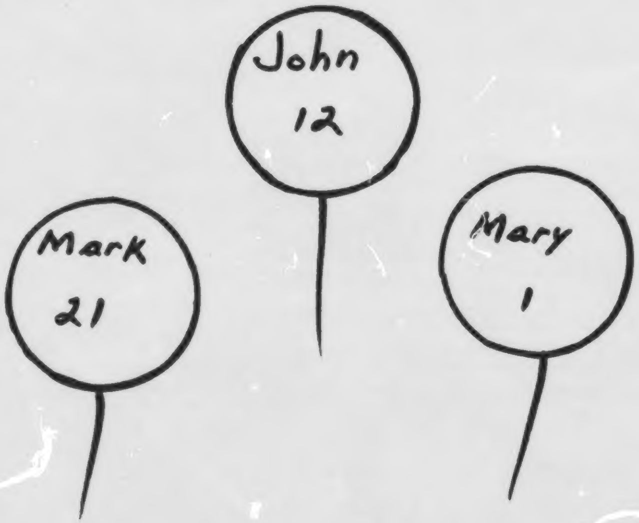
Possible Resources

Title: Birthday Balloons
Group Size: entire class
Materials: construction paper cut into 9" circles, magic marker pen, yarn

Procedure:

- Teacher directs each student to cut a 9" circle and write his/her name in the circle (teacher may have to write the names for some students).
- Teacher attaches yarn to each circle and places the circles on the bulletin board to represent the birthdays for that month. Don't forget the summer birthdays.

JUNE BIRTHDAYS



District Resources

ALL SCHOOLS PROJECT

Suggested Objective Placement 2

tudent Learning Objective(s) The student knows the names of the months in sequence.

State Goal 1,2,7

District Goal

Program Goal

elated Area(s) Language Arts, Math - Graphs, Social Studies

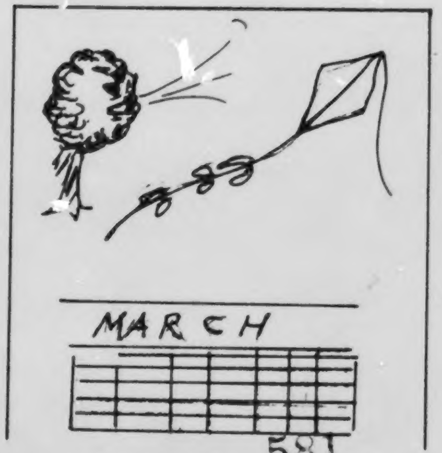
uggested Activities: Grade(s) 2

Title: Calendars
Group Size: entire class
Materials: 12"x18" sheets of colored construction paper, ditto master of calendar outline, variety of art materials dependent upon selected art motif for each month

rocedure: (this is a continuing project)

- Teacher directs students to fill in the calendar outline with month, year and days of week. Students fill in numerals. (Check to see that students begin the month on the correct day.)
- Teacher attaches calendar form to lower part of 12"x18" colored paper. Use the remaining area for design representing specific month.

Examples: Art Motifs:



Sept.: sponge paint autumn tree

Oct.: torn paper (black) Halloween shapes on orange and black

Nov.: trace hand for body of turkey on yellow

Suggested Monitoring Procedures

Mini-Test: "Months"
Group Size: one student
Procedure:

- Student recites names of months from January to December to teacher.

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 168-169

District Resources

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources

Title: Month Riddles
Group Size: small group
Materials: paper, pencil

Procedure:

- Teacher directs groups to write riddles for each month of the year, using representative holidays as clues (weather or special events are also good clues).
- Exchange riddles among groups.

Title: Birthday Graph
Group Size: individual
Materials: graph paper (1/2") for each student, pencil, crayon

Procedure:

- Teacher surveys class to determine how many birthdays are in each month.
- Teacher organizes data and makes a bar graph showing number of birthdays per month.
- Teacher directs students to copy the bar graph on their sheets.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student knows that the short hand of the clock is the hour hand. B. The student knows that the long hand of the clock is the minute hand.

State Goal	1,2,7
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 1-2

Title:	Model Clocks
Group Size:	entire class
Materials:	paper plate for each student, blue paper strips, red paper strips, 1 brad for each student, crayons or pencils

Procedure:

- Teacher cuts red strips to represent hour hand on clock, or directs students to cut the strips a certain length (short).
- Teacher directs students to mark numerals on the paper plate (demonstrating to students how to do it).
- Teacher directs students to attach red strip to paper plate.
- Students practice telling time by hour, moving hour hand to the different positions.
- Teacher then directs students to place blue strips on clock (representing minute hand).
- Proceed to practice with minute hand; then with both hour and minute hands.

Suggested Monitoring Procedures

Mini-Test:	"Clock Hands"
Group Size:	one student
Materials:	clock

Procedure:

- The student orally explains that the short hand is the hour hand and the long hand is the minute hand.

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 157-158

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) A. The student knows that the term "minute" refers to a unit of time measurement. B. The student knows that the term "hour" refers to a unit of time equal to 60 minutes.

State Goal	1.2.7
District Goal	
Program Goal	

Related Area(s) __________

Suggested Activities: Grade(s) 1-3

Title: Measuring Time
Group Size: small group
Materials: paint, paper (or cardboard or paper plate, cardboard strips, brad)

Procedure:

- Teacher prepares a clock, either by painting a grandfather clock (see diagram) or making a paper plate clock.
- Teacher asks students to show various times on the clock. Example: 3:00, 4:30
- Teacher asks such questions as:
  "Show 12:00 on the clock. What time will it be in fifteen minutes?"
  "It is now 3:00 p.m. What time will it be in two hours?"
  "It is now 9:00 a.m. How long will you have to wait for morning recess?"
  "Set the clock for 10:30 a.m. How long will you have to wait for a movie that begins at 11:00 a.m.?"

Suggested Monitoring Procedures

Mini-Test: "Time to the Minute"
Group Size: one student
Materials: clock
Procedure:

- Teacher asks individual students to indicate specific times on the clock. Teacher observes student responses and records the responses.

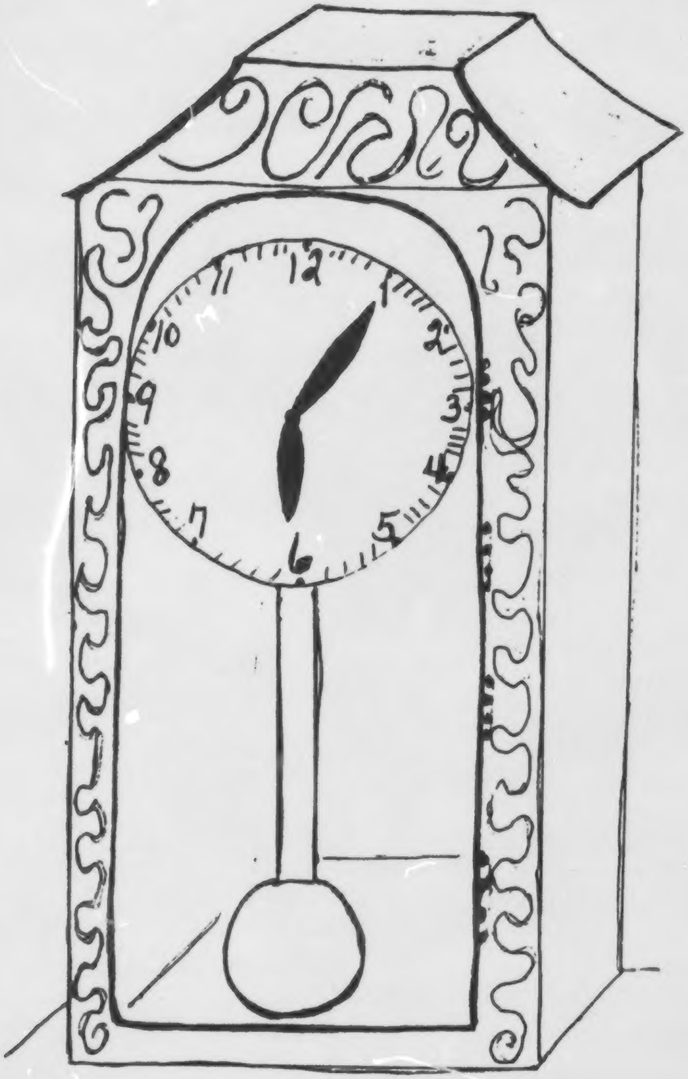
Possible Resources

LAP
L-00367 (from ESD 109 collection)

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 153-154

District Resources

Suggested Activities: Grade(s) ______


12
1
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Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student is able to tell time to the hour. B. The student is able to tell time to the half hour. C. The student values estimation as a useful skill in time assessment.

State Goal	1,2,7
District Goal	
Program Goal	

Related Area(s)

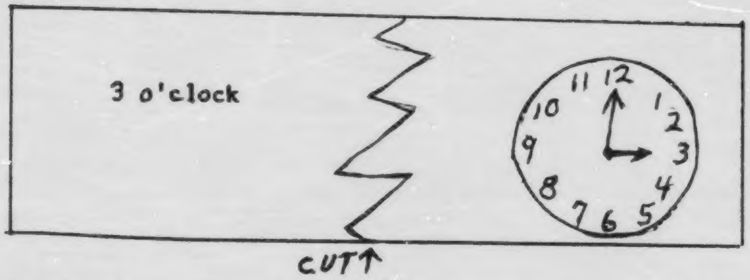
Suggested Activities: Grade(s) 1-2

Title: Clock Puzzle Strips
Group Size: pairs or small groups
Materials: 3"x12" tagboard strips

Procedure:

- Teacher prepares tagboard strips showing clock face on the right and written time on the left. Each clock should represent a specific hour. Cut a zigzag line to separate clock from written time. Each zigzag line should be different (to form puzzle).

Example:



- Teacher directs students to fit the puzzle pieces together.
- Mark puzzle strips with half hour.

Suggested Monitoring Procedures

Mini-Test: "Hour and Half Hour"
Group Size: one student
Materials: clock
Procedure:

- Student gives correct response to teacher when asked time and shown model clock (hour and half hour).

Teacher observation of student attitudes and behavior regarding punctuality, changing activities, etc. (Does student appear to value time and know how to tell time?)

Possible Resources

Judy Clock

District Resources

Suggested Activities: Grade(s) 1-2

Title: Telling Time
Group Size: any number of players
Materials: one large model clock (Judy Clock), small clock faces for each player

Procedure:

- Teacher divides the group into two teams. A leader is selected who sets the clock.
- The leader asks each player to set his/her clock to match the leader's clock. The leader checks each player's clock.
- The team with the most correct answers scores a point.
- The leader then resets the clock and the game proceeds.

Variation:

- Leader may write the time on the board and the players set their clocks accordingly.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOL[illegible] PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student is able to tell time to the hour. B. The student is able to tell time to the half hour. C. The student values estimation as a useful skill in time assessment.

State Goal	1,2,7
District Goal	
Program Goal	

Related Area(s)

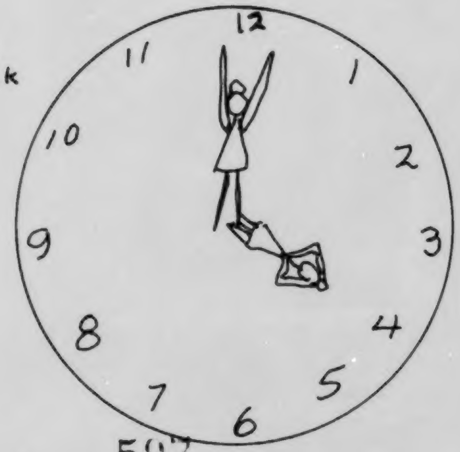
Suggested Activities: Grade(s) 1-2	Suggested Monitoring Procedures	Possible Resources

Title: Time Is Alive (suggested for K-1)
Group Size: entire class, large group
Materials: 12 large numerals

Procedure:

- Teacher takes group to gym.
- Pin numerals 1 to 12 on each of 12 students.
- Ask students to place themselves around a circle (on the gym floor) to represent a clock.
- Teacher selects two students to be the hands. Ask these students to lie on the floor with their feet at the center to represent the hands of a clock. The student representing the minute hand may extend his/her arms to indicate the longer hand.

4 o'clock



District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOO PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student is able to tell time to the hour. B. The student is able to tell time to the half hour. C. The student values estimation as a useful skill in measurement.

Related Area(s)

State Goal	1,2,7
District Goal	
Program Goal	

Suggested Activities: Grade(s) 1-2

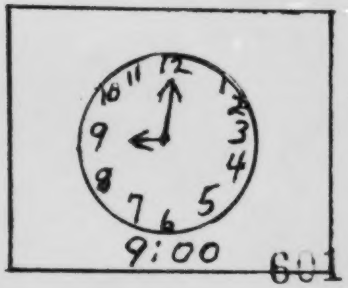
Title: Midnight

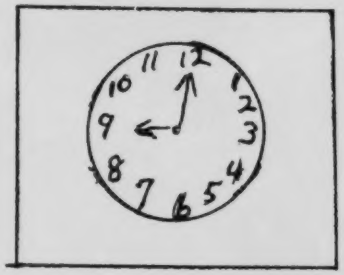
Group Size: two to twelve

Materials: two packs of cards (On each card is a clock face with a certain time on it. Below the clock face the time is written. No two cards are alike. On the second pack there is a clock face but the time is not written on the card.) Prepare enough markers for each player to cover playing cards.

Procedure:

- Teacher (or selected student) deals eight cards (from the deck without the time written on the card) to each player.
- Teacher (or selected student designated "caller") holds the cards with the time written on them. He reads them one at a time. If a player holds the appropriate clock, he puts a marker on the clock showing the time called.
- The first player to cover all his cards calls out "Midnight!".





Suggested Monitoring Procedures

Possible Resources

L-00233-P
L-00341-P
LAPS from ESD 109 collection

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 347

Holmes, Emma E., Mathematics Instruction for Children, Wadsworth Publishing Co., 1968, pp. 400-401

District Resources

Suggested Activities: Grade(s) _______

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1-2

Student Learning Objective(s) A. The student is able to tell time to the hour. B. The student is able to tell time to the half hour. C. The student values estimation as a useful skill in time measurement.

State Goal	1,2,7
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 1

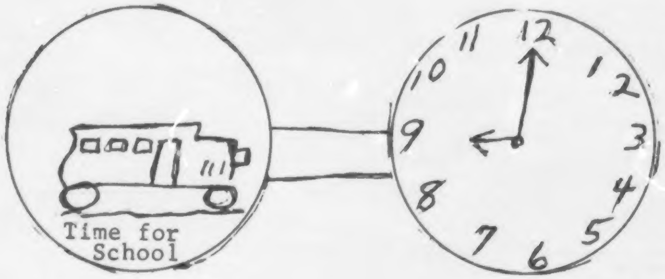
Title: A Time Diary
Group Size: entire class
Materials: two large circles (9" diameter), yarn

Procedure:

- Teacher puts a clock face on one circle and an appropriate illustration on another circle. Attach with yarn.
- Teacher places clocks around the room to expose students to time.

Variation:

- Illustrate lunch time, recess, daily activities, release time.



Suggested Monitoring Procedures

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 159-160

District Resources

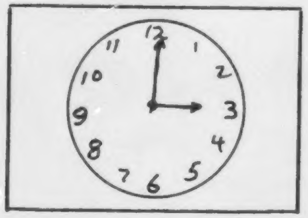
Suggested Activities: Grade(s) 1	Suggested Monitoring Procedures	Possible Resources

Title: Judy Clock
Group Size: individual
Materials: Judy Clock, 3"x5" time cards

Procedure:

- Teacher paints clock face on back side of a 3"x5" card and the appropriate time on the front side.
- Give the student a Judy Clock and several prepared cards. After the student reads the time on the card and sets the time on the Judy Clock, he/she turns over the card and checks the time with the picture.

3 o'clock



District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) The student is able to tell time to the quarter hour.

State Goal ☐

District Goal ☐

Program Goal ☐

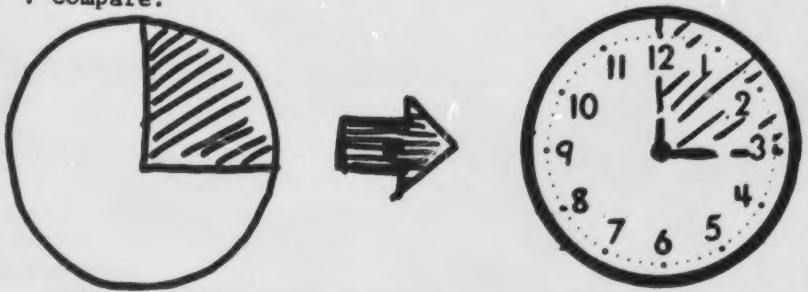
Related Area(s) ________

Suggested Activities: Grade(s) ______

Title: The Quarter Hour
Group Size: small group/entire class
Materials: circular regions
clock stamp and pad
pencil

Procedure:

- Teacher directs class to fold circular region into two parts of the same size.
- Shade each half.
- Teacher directs class to fold circular region twice in order to obtain four parts of the same size.
- Shade each quarter.
- Fold a clock face into four equal parts and shade one-fourth.
- Compare:

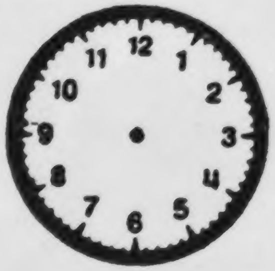


and thus relate one-fourth of the circular region to a clock face showing quarter past 12.

Suggested Monitoring Procedures

Mini-Test: "Hands"
Group Size: entire class
Materials: clock faces
Procedure:

- Show these times:



quarter past 4

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quarter to 9

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 160-161

Henderson, George L., Let's Play Games in Mathematics, Vol. 1, National Textbook Co., 1970, pp. 17-18; p. 52

Clock Stamp - Developmental Learning Materials, 7440 Natchex Avenue, Niles, Illinois 60648
Price: $2.90

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
. Demonstrate how and when a minute hand moves from one hour to the next it has covered one-fourth of the face of the clock when it gets to 3. . Use a series of similar activities to illustrate the concept of quarter to.		
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3-4

Student Learning Objective(s) The student is able to tell time by five-minute intervals.

State Goal	1,2,7
District Goal	
Program Goal	

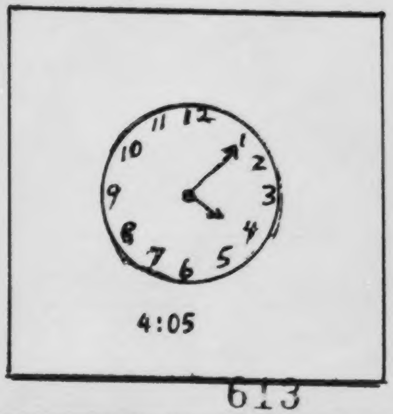
Related Area(s)

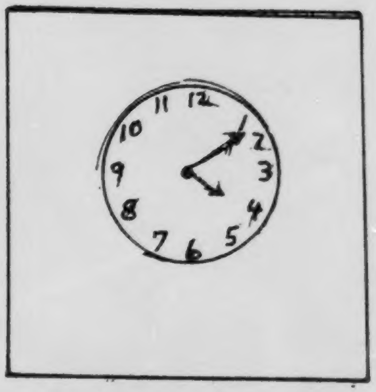
Suggested Activities: Grade(s) 3-4

Title: Midnight
Group Size: two to twelve
Materials: Two decks of cards. One deck has clock faces and the time written on the cards; the second deck has the clock face only. No two cards are alike. Prpeare enough markers for each player to cover cards.

Procedure:

- Teacher selects a student to be "caller". Caller holds the cards with the written notations.
- Teacher selects student to deal the cards (about 8 to a player--just so each player has an equal number of cards).
- The caller reads his/her cards one at a time. If a player has the appropriate clock, he/she puts a marker on the clock.
- The first player to cover all his/her cards calls out "Midnight!".

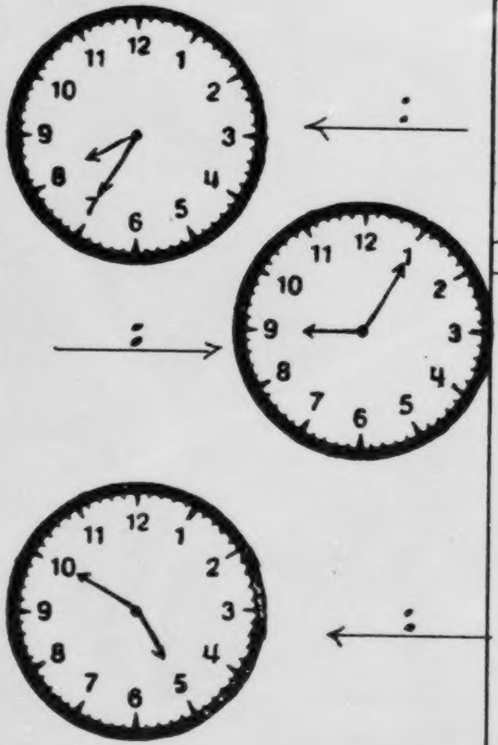




Suggested Monitoring Procedures

Mini-Test: "Five-Minute Intervals:
Group Size: entire class
Materials: clock faces
Procedure:

- Tell these times.



Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, p. 347

L-01119-P
LAP from ESD 109 collection

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

Student Learning Objective(s) The student is able to write time in notation, i.e., 12:00, 12:30, 12:15, 12:55

State Goal	1,2,7
District Goal	
Program Goal	

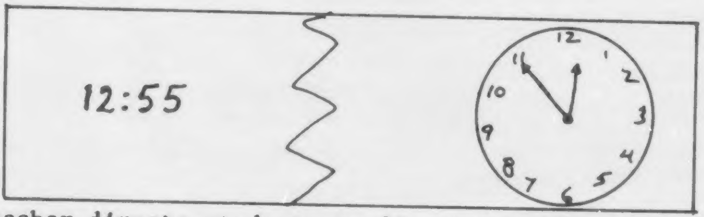
Related Area(s)

Suggested Activities: Grade(s) 3

Title: Clock Puzzle Strips
Group Size: individual or partners
Materials: 3"x12" tagboard strips

Procedure:

- Teacher prepares tagboard strips showing clock face on right and written time on the left. Cut the strip along a zig-zag line, separating the clock face from the written notation. Each zig-zag should be different (to make puzzle pieces).



- Teacher directs students to fit the puzzle pieces together.

Suggested Monitoring Procedures

Paper and pencil test--teacher dictates and student writes the time.

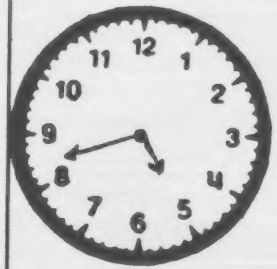
Teacher gives students clock faces on paper. Students write the correct time below the face.

Mini-Test: "Time in Notation"
Group Size: entire class
Materials: clock faces (see below)

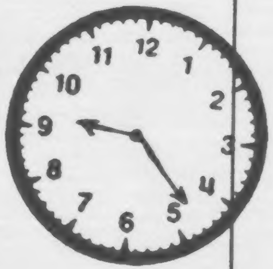
Procedure:

- Write time in notation.

Examples:



5 : 42



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Possible Resources

Digital Clock

District Resources

Suggested Activities: Grade(s) 3

Suggested Monitoring Procedures

Possible Resources

Title: Paper Plate Clocks
Group Size: individual
Materials: paper plates, strips for hands, brads, crayon or pencil

Procedure:

- Teacher directs students to make paper plate clocks (teacher demonstrates how).
- Teacher gives a time and directs students to set their clocks appropriately.

Variation:

- Select students who are quicker than the others to act as "expert watchmakers". These students may check other students' clocks and help adjust them. Older students may also be helpful.

Extension:

- Some students may make up problems for each other to solve, such as: "I usually wake up at 7:45 a.m. Today I woke up ten minutes early. What time was it?"

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ______

Student Learning Objective(s) The student values estimation as a useful skill in time measurement.

State Goal ☐
District Goal ☐
Program Goal ☐

Related Area(s) ______

Suggested Activities: Grade(s) K-3

Title: Hour Estimate
Group Size: two students
Materials: pencils and paper
picture of transportation vehicles with the time in hours and minutes that various members of a family spent on each in the summer (see picture on back)

Procedure:

- Each student chooses one of the elapsed times in the picture.
- Each then estimates the total hours for the elapsed time for both pictures and writes the estimate on a piece of paper.
- The players work together to find the exact number of hours and minutes.
- A point is scored for each student whose hour estimate was correct.
- Play again, choosing two elapsed times each. Score 2 points for each correct estimate.
- Play again, choosing three elapsed times each. Score 3 points for each correct estimate.
- Start over again with 1 elapsed time each. Continue until one student is ahead by 4 or more points.
- This student is the winner.

See page 312 for illustration.

Suggested Monitoring Procedures

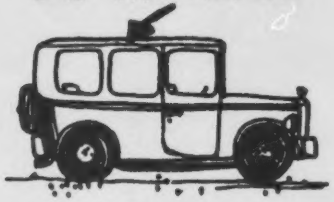
Possible Resources

District Resources

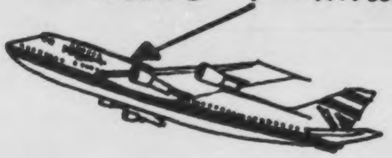
Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources

Fun Time

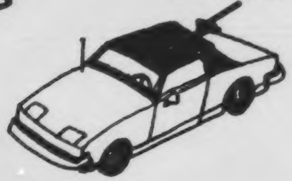
55 minutes



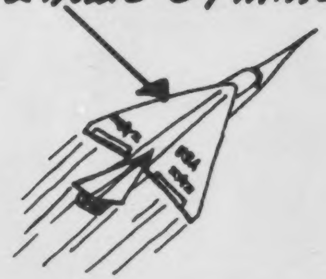
4 hours 17 minutes



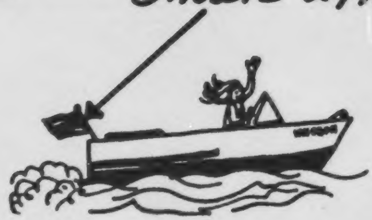
2 hours 30 minutes



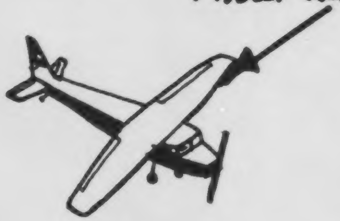
2 hours 59 minutes



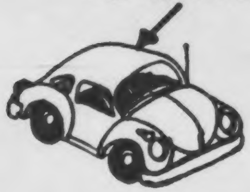
3 hours 29 minutes



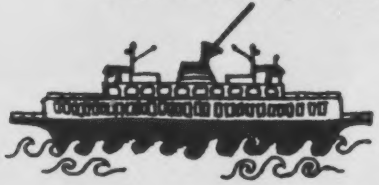
1 hour 22 minutes



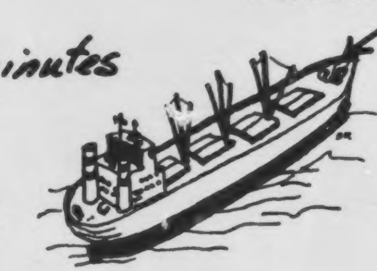
15 minutes



6 hours 45 minutes



7 hours 35 minutes



strict Resources

623

624

SUBJECT: **Mathematics**

SPECIFIC AREA: **Measurement: Money**

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4
The student knows:							
. the term "penny", "nickle", and "dime" are monetary units.	315-	1					
. that five pennies have the same value as one nickel.	315-	1					
. that ten pennies have the same value as one dime or two nickels.	315-	1					
. the equivalent change of coins equal to or less than 10 cents.	315-	1					
. 25 pennies have the same value as a quarter.	321-	2-3					
. a quarter is one-fourth of a dollar.	321-	2-3					
. the combination of coins which have the same value as a quarter	321-	2-3					
. the combination of coins which have the same value as one dollar.	321-	2-3					
The student is able to:							
*. combine coins equal to or less than 10 cents.	317	1					
*. combine coins that have the same value as a quarter.	317	2-3					
*. combine coins that have the same value as a dollar.	321-	2-3					
The student values:							
. estimation as a useful skill in money measurement.	323-	2-3					

625

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ________________

Suggested Objective Placement K-1

Student Learning Objective(s) A. The student knows the terms "penny", "nickel" and "dime" are monetary units. B. The student knows that five pennies have the same value as one nickel. C. The student knows that ten pennies have the same value as one dime or two nickels. D. The student knows the equivalent change of coins equal to or less than ten cents.

Related Area(s) _____

State Goal	1,7,8,9
District Goal	
Program Goal	

Suggested Activities: Grade(s) K-1

Title: Cards and Money
Group Size: small groups
Materials: 18 3"x5" tagboard cards, 10 pennies, 4 nickels, 4 dimes

Procedure:

- Teacher provides a stack of cards (or circles), each of which has a value of 1¢, 5¢ or 10¢ written on it, and places them in a pile face down.
- Teacher provides each of two students a supply of an equal number of pennies, nickels and dimes.
- Teacher directs first student to take the top card and turn it over to show the value written on the other side. The student must give the other student that amount of money.
- The second student takes his/her turn.
- When one student runs out of coins, the student with all the coins is the winner.

Variations:

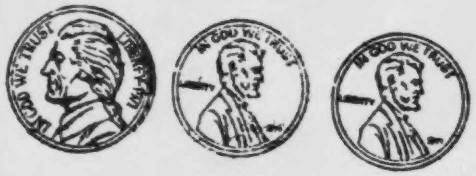
- 1. Make cards from 1¢ to 5¢ and play the same game.
- 2. Make cards from 5¢ to 10¢ and play the same game.

Title: Ring-A-Coin
Group Size: small groups
Materials: 1 2"x4" wood block 20" long, 5-1/4" dowel pegs, 6 1" wide rings from oatmeal cereal boxes, pennies

Suggested Monitoring Procedures

Mini-Test: "Small Change:
Group Size: entire class
Materials: pictures of coins
Procedure:

- Tell how much money:



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Possible Resources

Henderson, George, Let's Play Games in Mathematics, Vol. 1, National Textbook Co., 1970, p. 60, p. 66

Coin Stamps and Pad from Developmental Learning Materials

District Resources

Suggested Activities: Grade(s) K-1

Procedure:

- Students stand behind a given line and toss the rings onto the peg board. When a ring lands on a peg, the student receives the number of pennies marked on that peg.
- Student adds total number of pennies and tells the equivalent of that amount in nickels, dimes and pennies.

Title: Pick A Penny
Group Size: small groups
Materials: small box with 50 pennies, stack of 3x5 cards or construction paper in rectangles or circles

Procedure:

- Teacher writes a numeral (1, 2, 3, 4 or 5) on each 3x5 card or construction paper shapes.
- Place cards face down on the table.
- Teacher directs students to take turns drawing a card.
- Student takes a card from the top of the pile, looks at the numeral and removes that number of pennies from the box and returns the card to the bottom of the pile.
- When all the pennies have been removed from the box, students count the pennies and the one with the most wins.

Variation: Add nickels and dimes and increase the numbers on the cards to 10.

Suggested Monitoring Procedures

Teacher observes student to assure that he/she is removing the proper amount of money.

Possible Resources

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement ________

Student Learning Objective(s) A. The student is able to combine coins equal to or less than 10 cents. B. The student is able to combine coins that have the same value as a quarter.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s) ________

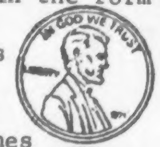
Suggested Activities: Grade(s) ________

Title: Pennies, Nickels, Dimes

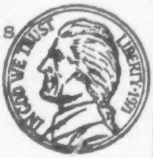
Group Size: individuals, small group, entire class

Materials: coin stamp and pad to develop play money in the form of

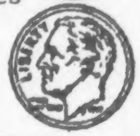
pennies



nickels



and dimes



Money Chart (see below)

Procedure:

- Use pennies, nickels, or dimes to show the amount of money in as many different ways as possible.

1 nickel	
1 dime	
1 quarter	

Suggested Monitoring Procedures

Possible Resources

Coin Stamps
From: Developmental Learning Materials, 7440 Natchex Avenue, Niles, Illinois 60648
Price: $5.50 U.S. heads
Price: $5.50 U.S. tails

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) A. The student knows the terms "penny", "nickel" and "dime" are monetary units. B. The student knows that five pennies have the same value as one nickel. C. The student knows that ten pennies have the same value as one dime or two nickels. D. The student knows the equivalent change of coins equal to or less than ten cents.

Related Area(s)

State Goal	1,7,8,9
District Goal	
Program Goal	

Suggested Activities: Grade(s) 1

Title: How Many Ways Can You Make 10?
Group Size: small group or individual
Materials: 1 dime, 3 nickels, 15 pennies, chart (see below)

Procedure:

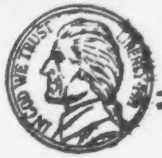
- Students are to find as many different ways as possible to find the amount of money to 10¢. (See diagram.)

Dime	Nickel	Penny
1	0	0
0	2	0
0	1	5
0	0	10

Suggested Monitoring Procedures

Mini-Test: "Cents"
Group Size: entire class
Materials: coin picture
Procedure:

- Tell how much money:



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Possible Resources

Henderson, George L., Let's Play Games in Mathematics, Vol. 2, National Textbook Co., 1970, p. 41

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student knows that 25 pennies have the same value as a quarter. B. The student knows that a quarter is one-fourth of a dollar. C. The student knows the combination of coins which have the same value as a quarter. D. The student is able to combine coins that have the same value as one dollar.

State Goal	1,7,8,9
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: How Many Ways To Make A Quarter?
Group Size: entire class
Materials: sets of play coins or paper "coins" labeled according to value (these can be dittoed and cut out by students -- pennies can be dittoed on tan or rust-colored paper, other coins on gray), record sheets

Procedure:

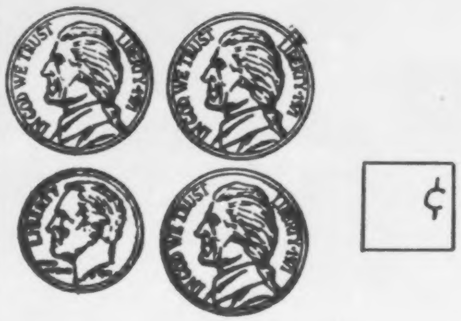
- Teacher instructs the students to make as many different combinations of coins that have the same value as a quarter.
- Student records the kinds and number of coins needed to make up 25 cents, e.g., 5 pennies, 2 nickels, 1 dime.

Suggested Monitoring Procedures

Place a number of coins on a table. Have each student select a group of coins that have the same value as a quarter, if necessary. Observe if students can do this successfully.

Mini-Test: "Less Than A Dollar"
Group Size: entire class
Materials: coin picture
Procedure:

- Tell how much money:



Possible Resources

Henderson, George L., Let's Play Games in Mathematics, Vol. 2, National Textbook Co., 1970, p. 48

District Resources

Suggested Activities: Grade(s) 2-3

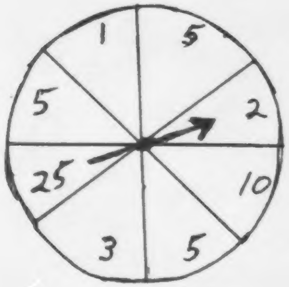
Suggested Monitoring Procedures

Possible Resources

Title: Exchange
Group Size: 2-4 or more
Materials: sets of imitation "coins", either purchased or teacher-made, have about 100 pennies, 25 nickels, 25 dimes and 10-20 quarters; a spinner marked as follows:

Procedure:

- Teacher places coins in a "bank".
- Each student, in turn, spins the spinner.
- The number the spinner points to indicates the amount of money a player can withdraw from the bank.
- When players have accumulated 25 cents, in any combination, they may exchange them for a quarter.
- Player with the most quarters at the end of play wins.



District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

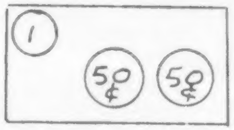
Student Learning Objective(s) A. The student knows the combination of coins which have the same value as one dollar. B. The student is able to combine coins that have the same value as a dollar. C. The student values estimation as a useful skill in money measurement.

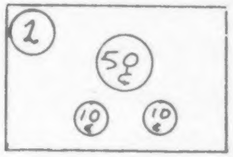
State Goal	1,7,8,9
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Dollars
Group Size: individual (or 1 student per set of cards)
Materials: a set (or sets) of numbered cards (15 to 20) that show sets of coins--some equalling a dollar, some not--each card should be numbered; a record sheet with numbers on it corresponding to the numbers on the cards





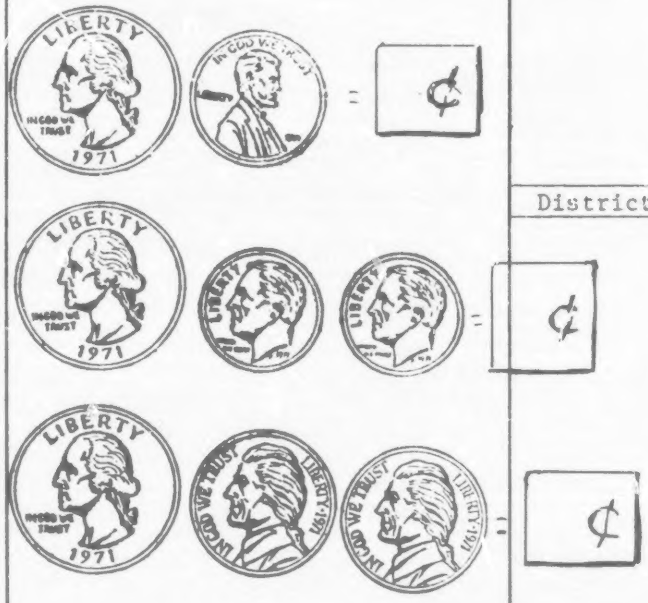
Record Sheet

	Amount
1. ____	
2. ____	.70
3. ____	
4. ____	
5. ____	

Procedure:
- Teacher instructs students to count money shown on a card.
- The student records whether the money shown on the card has the same value as a dollar or not, with a yes or no on the appropriate line. If the answer is no, the student puts down the value of the money on the card.

Suggested Monitoring Procedures

Mini-Test: "Loose Change"
Group Size: entire class
Materials: coins or coin picture
Procedure:
- Tell how much money:



Possible Resources

Silvey, Linda, Money Matters, Creative Publications, 1973, pp. 7-9

Coin stamps and stamp pad

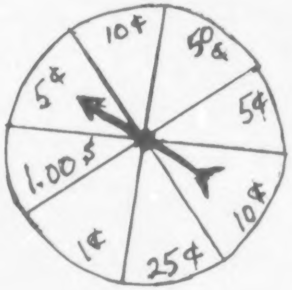
District Resources

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

Title: Dollar Exchange
Group Size: 2-4 or more
Materials: play "coins", enough to include 100 pennies, 50 dimes, 50 nickels, 25 quarters, 24 half-dollars, 25 dollar bills; a box (for bank); a spinner marked as follows:



Procedure:

- Teacher places coins in a bank.
- Students take turns spinning the spinner.
- The number a spinner points to indicates the amount of money a player can withdraw from the bank.
- When players have accumulated a dollar in change, they may exchange the coins for a dollar gill.
- The player with the greatest number of dollar bills at the end of the game wins.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student values estimation as a useful skill in money measurement.

State Goal ☐

District Goal ☐

Program Goal ☐

Related Area(s)

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

Title: Best Estimator
Group Size: two students
Materials: picture of items to purchase that have been priced

Procedure:

- Each student chooses one of the priced items in the picture (see other side).
- Each then estimates the total cost of the items that were chosen and writes the estimate on a piece of paper. The estimate is to the nearer dollar.
- The two students work together to find the exact total. A point is scored for each player whose dollar estimate was correct.
- Play again, choosing two items each. Score 2 points for each correct estimate.
- Play again, choosing three items each. Score three points for each correct estimate.
- Start over with one item each.
- The student who is first ahead by four points is the winner.

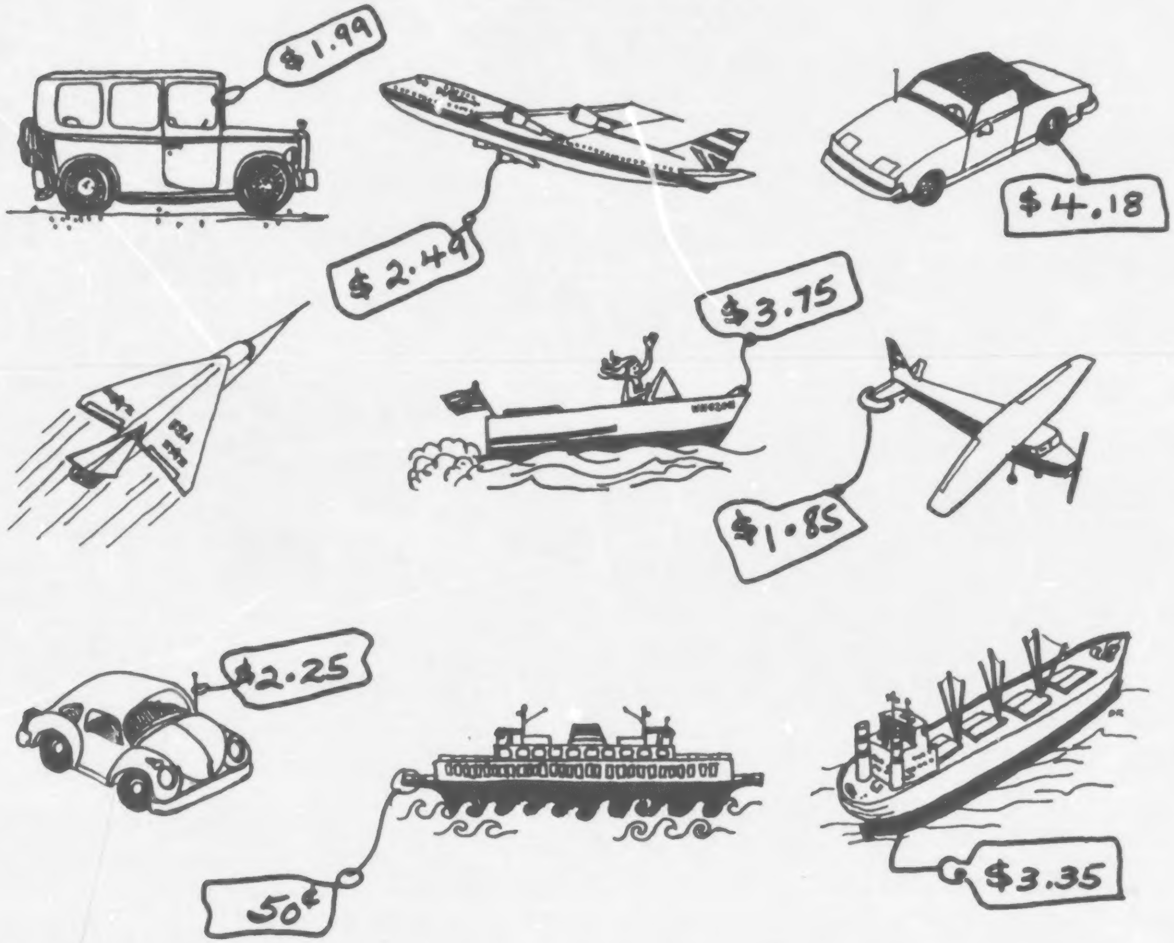
District Resources

618

619

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources

Model Sale


$1.99
$2.49
$4.18
$3.75
$1.85
$2.25
50¢
$3.35

District Resources

SUBJECT: Mathematics

SPECIFIC AREA: Measurement: Linear

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. the term "centimeter" refers to a metric unit of linear measurement.	329-	1					
. the term "inch" refers to a customary unit of linear measurement.	333	1					
. the term "meter" refers to a metric unit of linear measurement equal to 100 centimeters or 10 decimeters.	335-	2					
. the term "foot" refers to a unit of linear measurement equal to 12 inches.	337-	2					
. the term "yard" refers to a unit of linear measurement equal to 3 feet or 36 inches.	339	2					
. the term "half-inch" is a unit of linear measurement.	341-	3					
. the term "quarter-inch" is a unit of linear measurement.	343	3					
. two quarter inches equal one-half inch.	343	3-4					
. four quarter inches equal one inch.	343	3-4					
. four quarter inches equal two half inches.	343	3-4					
. the term "kilometer" is a metric unit of linear measurement.	345	3-4					
. the term "perimeter" refers to the linear measurement around a given space. (geometry)	347-	3-4					
. the term "mile" is a customary unit of linear measurement used to indicate distance.	355	3-4					
The student is able to:							
*. compare size using the following terms: longer, smaller, largest, smallest, taller, tallest, longest, shortest, same.	349-	K-1					
*. measure an object(s) using centimeters.	329-	1					
*. measure the length of an object(s) using inches.	333	1					
*. measure length using a meter stick.	335-	2					
*. measure length using a foot ruler.	337-	2					
*. measure length using a yardstick.	339	2					
*. estimate lengths.	351-	2-3					
. measure a specific length to the nearest half-inch.	343	3-4					
. measure a specific length to the nearest quarter-inch.	343	3-4					
. measure the perimeter of a simple geometric figure.	347	3-4					
. compute distance in miles.	355	3-4					
The student values:							

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOOL PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) A. The student knows the term "centimeter" refers to a metric unit of linear measurement. B. The student is able to measure an object(s) using centimeters.

State Goal	1,6,7,9
District Goal	
Program Goal	1,3,4

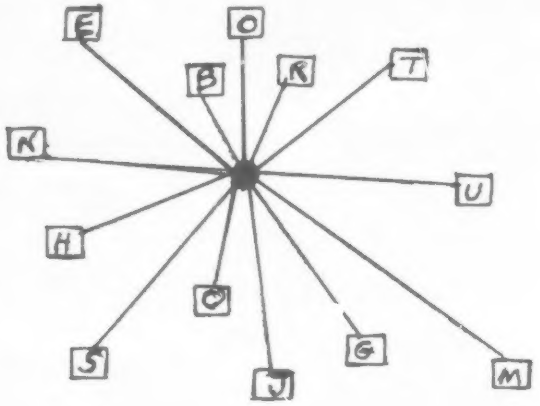
Related Area(s)

Suggested Activities: Grade(s) 1

Title: Mystery Message
Group Size: any number can play
Materials: centimeter ruler, ditto puzzle, answer sheet

Procedure:

- Duplicate copies of a puzzle with the letters for a message placed at specific distances (in centimeters) from a center point.



- Teacher tells students that something has disappeared in the classroom and that they can find a clue hidden in a mystery measuring maze.

Suggested Monitoring Procedures

Mini-Test: "Centimeter Measure"
Group Size: entire class
Materials: centimeter ruler
Procedure:

- Find the length of your mathematics textbook in centimeters.

Possible Resources

District Resources

Suggested Activities: Grade(s) 1

Suggested Monitoring Procedures

Possible Resources

- Teacher gives students a list of measurements to find and asks them to find which letters have lines with those lengths.
- Students then unscramble the letters and combine them into words to discover the message.
- For this puzzle, you might hide one surprise coupon with the name of each student. The prize might be a treat or special privilege.

Example Answer Sheet

Fill in blanks with the letter of the line that measures each length.

____ ____ ____ ____ ____ ____
6 3 12 10 16 8

(Numbers refer to centimeter measurements.)

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) A. The student knows the term "centimeter" refers to a metric unit of linear measurement. B. The student is able to measure an object(s) using centimeters.

State Goal	
District Goal	
Program Goal	1,3,4

Related Area(s)

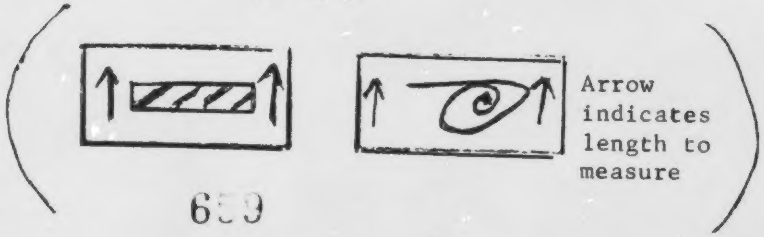
Suggested Activities: Grade(s) 1

Title: Measure Up!
Group Size: pairs of students
Materials: game board as follows:
game cards 3"x8" with pictures of objects to be measured in centimeters, 2 rulers (actual rulers or drawn at bottom of game board)

Can You Measure Up?

Yours				Mine			
4 Centimeters		6 cm		4 cm		6 cm	
5 cm		2 cm		5 cm		2 cm	
1 cm		3 cm		1 cm		3 cm	
3 cm		1 cm		3 cm		1 cm	

18" X 24"



Arrow indicates length to measure

Suggested Monitoring Procedures

Given a paper with objects drawn on it, students will measure in centimeters and record their answers.

Possible Resources

Film: F-1946, Metric Measures Made Easy (ESD 109 collection)

L-00016-P LAP from ESD 109 collection

District Resources

Suggested Activities: Grade(s) 1	Suggested Monitoring Procedures	Possible Resources
Procedure: . Student selects a side of the board. Cards are placed face down in a pile. . Student draws a card and measures, using a ruler between the arrows shown on the card. If it matches a measurement on their side of the board, the card is placed next to that measurement. If it does not match, the card is put at the bottom of the pile. . The first student to complete his/her side of the board wins.		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1

Student Learning Objective(s) A. The student knows the term "inch" refers to a customary unit of linear measurement. B. The student is able to measure an object(s) to the nearest inch.

State Goal	1,6,7,9
District Goal	
Program Goal	1,3,4

Related Area(s)

Suggested Activities: Grade(s) 1

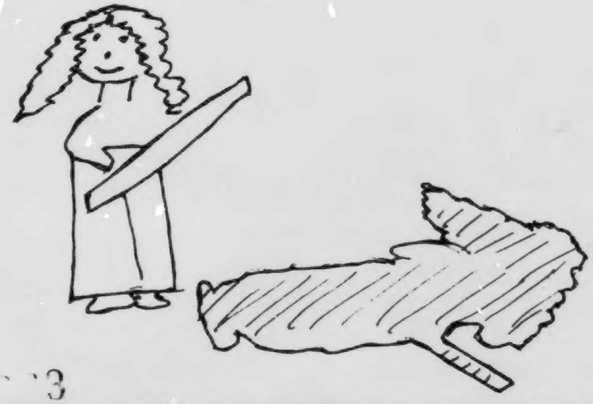
Title: Shadow Measure
Group Size: pairs of students
Materials: chalk, ruler, record sheet

Procedure:

- Teacher picks a sunny day to take students to a spot where they can see their shadows.
- Students will mark their partner's shadow. Each student then measures his/her own shadow with the ruler, to the nearest inch.
- The students can measure their shadow five times during the day, e.g., 9:30, 10:30, 12:30, 1:30 and 2:30 and compare the differing lengths.

Variations:

- Students can make graphs to show the different lengths.
- Questions teacher can ask: "How much taller is the tallest shadow?" "How much shorter is the shortest shadow?"



Suggested Monitoring Procedures

Given a paper with objects drawn in inches, the students measure with rulers and record answers next to object.

Mini-Test: "Inch Measure"
Group Size: entire class
Materials: inch ruler, pencils (new)

Procedure:

- Find the length of a new No. 2 pencil in inches.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 371-372

Henderson, George L., Let's Play Games in Mathematics, Vol. 2, National Textbook Co., 1970, p. 62

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) A. The student knows the term "meter" refers to a metric unit of linear measurement equal to 100 centimeters or 10 decimeters. B. The student is able to measure using a meter stick.

State Goal	6
District Goal	
Program Goal	1,3,4

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Measuring With Meter Stick
Group Size: small group
Materials: meter stick

Procedure:

- Give the students each a meter stick. Ask them first to find the number of centimeters and then the number of decimeters.

Title: Measuring The Room
Group Size: individual
Materials: meter stick, record sheet

Procedure:

- The students are to measure the room dimensions, sidewalk, wall, etc., with the meter stick and record the measurements.

Suggested Monitoring Procedures

Mini-Test: "Meter Measure"
Group Size: small group
Materials: meter sticks
Procedure:

- Each student measures one of the following using a meter stick:
  - length of hallway
  - width of hallway
  - your height
  - the length of five of your paces (strides)

Possible Resources

District Resources

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources

Title: Metric Train
Group Size: small groups
Materials: tagboard 2 cm wide and 10 cm long, pencil, meter stick for each student

Procedure:

- The teacher measures and marks the centimeters on 20 tagboard rulers.
- The students count the centimeters in each tagboard ruler (which is a decimeter long). The student then makes a train next to the meter stick of the decimeter rulers to equal a meter.
- The student then counts the decimeters and can now count the centimeters 1 to 100, or he/she can add ten, 10 times.

District Resources

SMALL SCHOO[illegible] PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) A. The student knows the term "foot" refers to a unit of linear measurement equal to 12 inches. B. The student is able to measure using a foot ruler.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,3,4

Related Area(s)

Suggested Activities: Grade(s) 2

Title: Inches
Group Size: individual, small group, large group
Materials: ruler marked only in inches

Procedure:

- Give a ruler to each student and ask students to count the inches.

Title: Foot/Inches
Group Size: individual, small or large group
Materials: tagboard strips an inch in length, tagboard strips a foot in length

Procedure:

- Teacher lays out twelve inch-long strips and compares them with a one-foot strip

Title: Room Measure
Group Size: individual
Materials: 1-foot rulers, worksheets

Procedure:

- Teacher directs student to measure various objects in the room, e.g., window width, student height, etc.

671

Suggested Monitoring Procedures

Possible Resources

Henderson, George L., Let's Play Games in Mathematics, National Textbook Co., 1970, pp. 60-61

District Resources

672

Suggested Activities: Grade(s) 2	Suggested Monitoring Procedures	Possible Resources

Title: Shadow Measure
Group Size: pairs of students
Materials: foot ruler, pencil, record sheet, sunny day

Procedure:

- Teacher takes students outside on a sunny day and has them measure shadows of various objects to the nearest foot, e.g., trees, playground equipment, principal, etc. These can be measured at different times of the day by the same students or different students.
- Record the findings on the bulletin board or chalkboard. These answers can be used for discussion in related area of science.

Title: Tree Shadows
Group Size: entire class
Materials: rulers, tree (must be short enough so that students can reach the top using stools or kitchen step ladder)

Procedure:

- Teacher and students select a suitable tree and measure its height. Students then measure the tree's shadow.
- Measure students' heights and have them lie down head to head, or feet to feet, to determine the height of the tree.

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 2

Student Learning Objective(s) A. The student knows the term "yard" refers to a unit of linear measurement equal to 3 feet or 36 inches. B. The student is able to measure using a yardstick.

State Goal	1,7, 9,10
District Goal	
Program Goal	1,3,4

Related Area(s)

Suggested Activities: Grade(s) 2

Title:
Group Size: individual, small group, entire class
Materials: yardstick

Procedure:

- Give each student a yardstick and have them count the inches. Ask: "How many inches in a yard? How many feet in a yard?"
- Measure objects in room. Write equivalent measurements. Desk is 1 yard 6 inches, or 42 inches, or 3 feet 6 inches.

Title:
Group Size: any number
Materials: tagboard strips 1-foot long

Procedure:

- Lay out foot strips and compare to length of yardstick.

Suggested Monitoring Procedures

Mini-Test: "Yard Measure"
Group Size: small group
Materials: yardsticks
Procedure:

- Each student measures one of the following using a yardstick:
  - width of classroom
  - length of chalkboard
  - height of doorway
  - width of window
  - length of bulletin board

Possible Resources

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 3

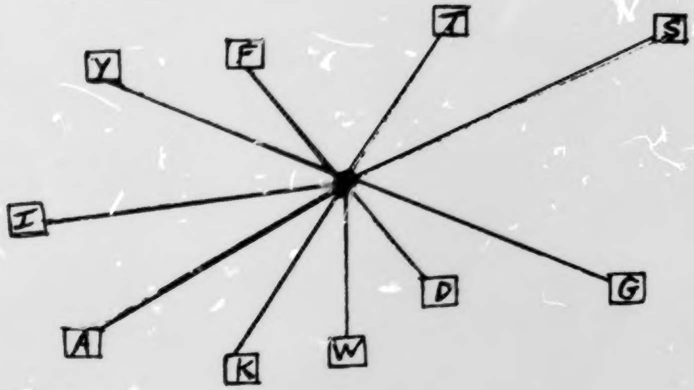
Student Learning Objective(s) A. The student knows the term "half-inch" is a unit of linear measurement. B. The student is able to measure a specific length to the nearest half-inch.

State Goal	1,7,10
District Goal	
Program Goal	1,2, 3,7

Related Area(s)

Suggested Activities: Grade(s) 3

Title: Mystery Message
Group Size: entire class
Materials: worksheets with a puzzle like the example below:



Procedure:

- Tell the students that something has disappeared in the classroom and they can find a clue hidden in a mysterious maze.
- Duplicate copies of a puzzle with the letter for a message placed at specific distances from a center point.
- Give students a list of measurements to find and ask them to find which letters have lines with those lengths.
- Students then unscramble the letters and combine them into words to discover the message.

Suggested Monitoring Procedures

The student will measure drawings to the nearest half-inch, using a ruler.

Teacher observes the student using the ruler.

Mini-Test: "Nearest Half-Inch"
Group Size: entire class
Materials: inch rulers with one-half unit marks

Procedure:

- Draw a line 5½ inches long.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart, Winston, 1973, pp. 371-372

Henderson, George L., Let's Play Games in Mathematics, Vol. 2, National Textbook Co., 1970, p. 50

District Resources

Suggested Activities: Grade(s) 3

- Doing this puzzle, you might hide one surprise coupon with the name of each student. The prize might be a treat or a special privilege for each individual.

Direction and Answer Sheet

Fill in blanks with the letter of the line that measures each length:

___ 6½"
___ 2½"
___ 5½"
___ 3½"
___ 4½"

Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Objective Placement ______

State Goal	
District Goal	
Program Goal	

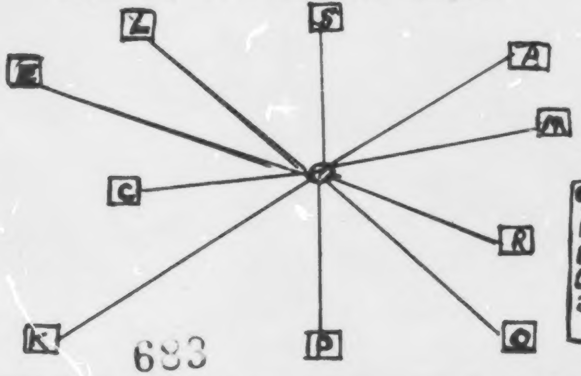
Student Learning Objective(s) A. The student knows the term "quarter-inch" is a unit of linear measurement. B. The student knows that two quarter-inches equal one-half inch. C. The student knows that four quarter-inches equal one inch. D. The student knows that four quarter-inches equal [illegible] two half-inches. E. The student is able to measure a specific length to the nearest half-inch. F. The student is able to measure a specific length to the nearest quarter inch.

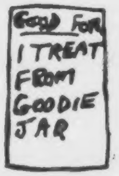
Suggested Activities: Grade(s) 3

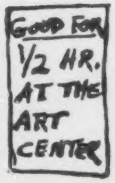
Title: Mystery Message
Group Size: small group
Materials: yardstick with quarter-inch divisions

Procedure:

- Tell the students that something has disappeared in the classroom and they can find a clue hidden in a mysterious measuring maze.
- Duplicate copies of a puzzle with the letters for a message placed at specific distances from a center point.
- Give each student a list of measurements to find and ask him/her to find which letters have lines those lengths.
- Students unscramble the letters and combine them into words to discover the message.
- For this puzzle, you might hide one surprise coupon with the name of each student. The prize might be a treat or a special privilege for each individual.
- Clue might be bookcase (word 7). When the students have unscrambled the letters they will look in the bookcase for a surprise coupon.







Suggested Monitoring Procedures

The student will measure to the nearest quarter or half-inch objects or drawing given by the teacher.

Mini-Test: "Nearest Quarter Inch"
Group Size: entire class
Materials: rule with quarter-inch units

Procedure:

- Have students draw a line 3-3/4 inches long.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 371-372

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

Suggested Objective Placement 3

Student Learning Objective(s) The student knows the term "kilometer" is a metric unit of linear measurement.

State Goal	1,6, 7,10
District Goal	
Program Goal	1,3,4

Related Area(s)

Suggested Activities: Grade(s) 3

Title:
Group Size: small group
Materials: meter stick

Procedure:

- Before introducing kilometer, you may ask different students to use meter sticks to mark off distances of 2, 3 and 4 meters. Develop the idea of how long these distances are.
- Using their meter sticks, the student may measure off 100 meters and get some idea that 10 times that distance is quite a large unit. It is a kilometer. At this point measure in meters, or kilometers.

Meters	Kilometers
Distance in playground:	Distance from town to town:
Distance of room:	Distance across countries:

- Some hints: Kilometers are used to measure large distances. "Kilo" means 1000. One kilometer is the same length as 1000 meters.

Suggested Monitoring Procedures

Ask the student when would he/she use the kilometer to measure distance.

Mini-Test: "Long Distances"
Group Size: entire class
Procedure:

- If centimeter is used to measure common lengths, for example body measurements, and the meter is used to measure intermediate lengths, for example room dimensions, what is used to measure long distances, for example, from one city to another?

Possible Resources

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources
689		690

Suggested Objective Placement 3

Student Learning Objective(s) A. The student knows the term "perimeter" refers to the linear measurement around a given space (geometry). B. The student is able to measure the perimeter of a given figure.

State Goal	1,7,10
District Goal	
Program Goal	1,2, 3,4

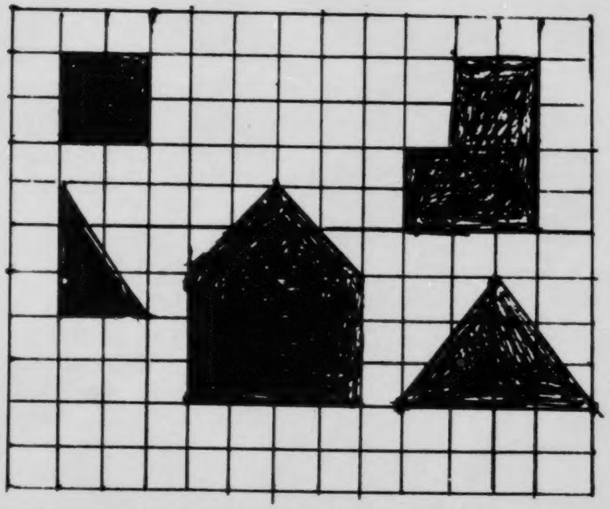
Related Area(s)

Suggested Activities: Grade(s) 3

Title:
Group Size: small group or entire class
Materials: transparencies, overhead projector, ruler

Procedure:

- Make a grid on transparency. Show it, using an overhead projector. **Example:**



- Students may come up and show how to measure the perimeter.

Suggested Monitoring Procedures

Observe student while measuring perimeter.

Paper-pencil test to measure perimeter.

Mini-Test: Perimeter
Group Size: entire class
Materials: centimeter ruler
Procedure:

- Find the perimeter:

_______ cm

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 379-381

District Resources

Suggested Activities: Grade(s) 3

- Students who have difficulty with the perimeter may work with cut-outs which have the measures written on each side, or blank on each side, or blank on one side. These could be laminated so they would last.
- Students will enjoy measuring the distances around various objects in the room: for example, a small window, the teacher's desk, their own desk or some books. This can be done in inches or centimeters.
- Students may be challenged to find the pattern in the following: Give them a triangle, square, pentagon and a hexagon. The sides of each shape are either 3 inches or 8 centimeters in length.
- Chart to record:

No. of Sides	Length of Each Side	Distance Around
3	8 cm	24 cm
4	8 cm	
5	8 cm	

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOO[illegible] PROJECT

Suggested Objective Placement K-1

Student Learning Objective(s) The student is able to compare size using the following terms: longer--smaller; largest--smallest; taller--longer--shorter; tallest--longest--shortest; same.

State Goal	1,7, 9,10
District Goal	
Program Goal	3

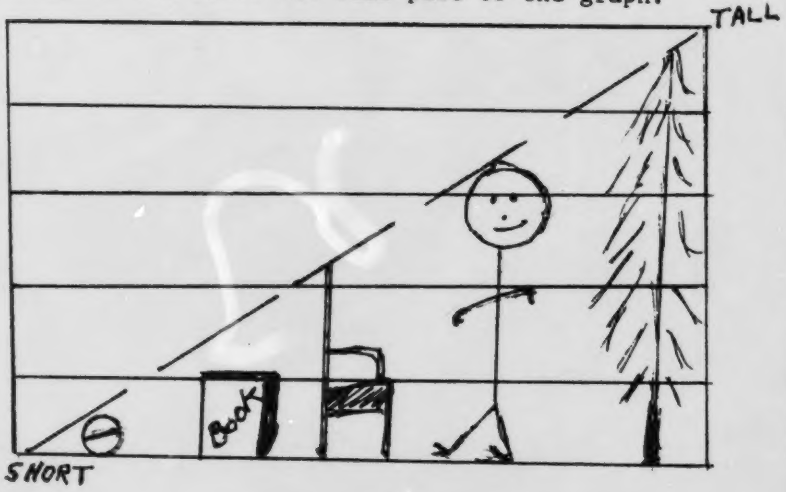
Related Area(s) Reading--Visual Discrimination

Suggested Activities: Grade(s) K-1

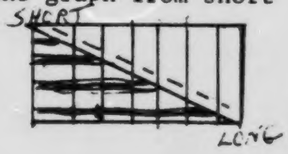
Title: Short and Tall
Group Size: small or large group
Materials: tagboard graph

Procedure:

- Teacher sets aside a large space on bulletin board for a collection of objects ranging in size from short to tall.
- Teacher directs students to draw in pictures that fit in the short and tall part of the graph.



- Variations: Make graph from short to long.



Suggested Monitoring Procedures

Teacher works individually with students. From a collection of objects varying in length, the student selects object in response to teacher questions or directions. Sample questions or directions:

"Which pencil is shorter, the red one or the blue one?"

"Which pencil is the longest?"

"Pick up the shortest crayon."

"Put the smallest bead in the box."

Mini-Test: "Comparing"
Group Size: entire class
Materials: figures on paper to compare

Procedure:

- Mark with an X the largest and with a ✓ the smallest.
- Mark with an X the longest and with a ✓ the shortest.

Possible Resources

Nelson, Doyle, Mathematical Experiences in Early Childhood, Encyclopedia Britannica Publications, Inc., 1972, pp. 62-83

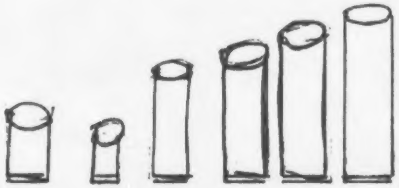
District Resources

Suggested Activities: Grade(s) K-1

Title: Cylinders
Group Size: individual
Materials: cardboard tubing cut into graduated sizes

Procedure:

- Teacher gives following directions: "Students arrange tubing from tallest to shortest."
- Teacher discusses with students the tubes that are short, tall, shorter, taller, shortest, tallest.



Title: Straw Comparisons
Group Size: individual, small group, entire class
Materials: cards labeled as follows--Same, Longest, Shortest, Longer, Shorter Taller, Smaller; 7 drinking straws, (some of which are the same length)

Procedure:

- Teacher gives the following directions to students:
  (a) Find two straws of the same length.
  (b) Find the longest straw--label it.
  (c) Find the shortest straw--label it.
  (d) Find two straws of different lengths. Label the shorter straw.
  (e) Prop two straws on end against the side of your desk. If they are of different lengths, label one "taller" and the other "shorter".

Suggested Monitoring Procedures

- Mark with an X the shapes that are the same.

Teacher elicits verbal response.

Teacher observation.

Possible Resources

District Resources

SMALL SCHOO PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student is able to estimate lengths.

State Goal	1
District Goal	
Program Goal	3

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title:
Group Size: entire class
Materials: a strip of cardboard or a string that has been pre-measured to equal foot, yard or a meter, a record sheet, a set of objects (or objects in the classroom)--can list some on the chalkboard

Procedure:

- Label the record sheet in 3 columns shown, putting the length of the cardboard or string in the blank:

Longer than ______	About the same as ______	Shorter than ______

- Using the objects in the set or observing objects around the room, estimate if they are longer than, about the same or shorter than, the model. Record the estimates in the appropriate columns on the record sheet.
- The students, one at a time, or in small groups (or the teacher), can use the model to demonstrate that each object is longer than, about the same or shorter than, the model. Mark mistakes or make corrections.

Suggested Monitoring Procedures

Teacher observes success during the listed activity.

Keep a record of success in doing the activity on several different occasions.

Mini-Test: "Estimating Lengths"
Group Size: one student
Procedure:

- Ask student to find objects that he/she estimates to be the same or different in length.
- Ask student to tell why these objects are the same or different and determine the logic of the answers.
- Ask student to estimate distances between two places in the room, and tell why he/she estimates a difference.
- Determine whether estimates and reasoning are logical.

Possible Resources

ESD 109 films
F - 1670 A Changing Size

District Resources

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

Title: Centimeter Measure
Group Size: individual, small group or whole class
Materials: 10 objects commonly found in any classroom

Procedure:

- Draw a table, such as:

May substitute pictures of objects for object words.

Object	Guess in Centimeters	The Measurement
Pencil		
Crayon		
Chalk		
Eraser		
Etc.		

- Guess the length of each object in centimeters. Record in guess column.
- Measure the length of each object in centimeters. Record the answers in the table.

District Resources

SMALL SCHOOL[illegible]ROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) The student is able to estimate lengths.

State Goal	1,7, 9.10
District Goal	
Program Goal	3

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Thumb Measures
Group Size: partners
Materials: book

Procedure:
- Guess how many thumbs wide your book is.
- Count the number of thumbs needed.
- Compare your answer with your partner's answer.

Title: Span Measures

> A span is the distance from your thumb to your little finger when you spread your fingers out as wide as possible.

Group Size: partners
Materials: paper and pencil to record answers

Procedure:
- Guess the length of your desk in spans.
- Measure the length of your desk in spans. Start with your thumb on the left side of your desk.
- Use one hand only, opening it to its fullest.
- Then close it by moving the thumb to the littlest finger each time.
- Count the spans needed and record your answer.
- Get your partner to measure desk with his/her span.
- Compare your answers.

Suggested Monitoring Procedures

Possible Resources

District Resources

Suggested Activities: Grade(s) 2-3

Title: Discover My Pattern

> A cubit is the distance from the tip of your middle finger to your elbow when your fingers are spread out as far as possible.

Group Size: one, small group or class
Materials: paper, pencil

Procedure:

- Choose 10 objects to measure and record your answers on a chart like this:

Object	Number of Spans	Number of Cabits
Door		
My Desk		
Etc.		

- Find a pattern in your chart.
- If you can find a pattern, what does it mean?

Suggested Monitoring Procedures

Possible Resources

Henderson, George L., Let's Play Games in Mathematics, Vol 2., National Textbook Co., 1970, pp. 20-21, p. 30

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement ______

Student Learning Objective(s) A. The student knows the term "mile" is a customary unit of linear measurement used to indicate distance. B. The student is able to compute distance in miles.

State Goal	☐
District Goal	☐
Program Goal	☐

Related Area(s) ______

Suggested Activities: Grade(s) ______

Title: The Estimate A Mile Contest
Group Size: small group
Materials: chalk, yardstick, odometer, pedometer, or cyclometer

Procedure:

- Teacher marks off a mile by use of odometer, pedometer, or cyclometer.
- Students are organized in pairs.
- The problem is to determine a mile given:
  1. a yardstick and chalk,
  2. the starting point from which to measure,
  3. the direction in which to measure.
- Students are allowed to measure the first ten yards only with the yardstick.
- Each pair marks with chalk the point at which they estimate to be the "end".
- Each pair determines their own strategy to "solve" the problem.

Suggested Monitoring Procedures

Mini-Test: "A Long Distance"
Group Size: one student
Procedure:

- Ask each student what customary unit of measure is used to measure long distances, e.g., distance between two cities.

Possible Resources

D'Augustine, Charles, Multiple Methods of Teaching Mathematics in the Elementary School, Harper and Row, 1973, pp. 349-351

District Resources

Suggested Activities: Grade(s) ______	Suggested Monitoring Procedures	Possible Resources
		District Resources

SMALL SCHOOLS PROJECT

SUBJECT: Mathematics

SPECIFIC AREA: Measurement: Capacity (Volume)

	Page	Suggested Grade Placement	District Placement				
			K	1	2	3	4
The student knows:							
. the term "liter" refers to a metric unit of volume measurement.	363	1-3					
. the terms "cup", "pint", "quart" and "gallon" refer to units of capacity measurement.	359-	1-3					
. two cups equal one pint.	359-	1-4					
. four cups or two pints equal one quart.	359-	1-4					
The student is able to:							
. measure capacity using the liter as the unit of measurement.	363	1-3					
*. measure capacity using a "cup", "pint", "quart" or "gallon" as the unit of measure.	359-	1-3					
The student values:							

711

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ____________

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) A. The student knows that the terms "cup", "pint", "quart" and "gallon" refer to units of capacity measurement. B. The student is able to measure capacity using a cup, pint, quart or gallon as the unit of measurement. C. The student knows that two cups equal one pint. D. The student knows that four cups or two pints equal one quart.

Related Area(s)

State Goal	1,7,9
District Goal	
Program Goal	

Suggested Activities: Grade(s) 1-3

Title: Fill 'Em Up!
Group Size: small group
Materials: old suitcase or box, beans, rice, unpopped popcorn, buttons, beads, containers of these sizes -- cup, pint, quart, gallon (label each container appropriately)

Procedure:

- Teacher asks questions of students who respond orally, or questions may be written on a list and placed by the box or suitcase.
- Sample questions:
  - _____ cups = 1 pint
  - _____ cups = 1 quart
  - _____ pints = 1 gallon
  - _____ quarts = 1 gallon
  - _____ cups = 1 galloon

Suggested Monitoring Procedures

Mini-Test: "Liquid Measure"
Group Size: one student
Materials: cup, pint, and quart containers, a large jar to hold water, water supply

Procedure:

- Ask each student to find the capacity of the large jar in cups, pints and quarts and to record each answer.

Possible Resources

Grossnickle, Foster E., Discovering Meanings in Elementary School Mathematics, Holt, Rinehart and Winston, 1973, pp. 364-365

District Resources

Suggested Activities: Grade(s) 1-3

Title: Cups and Quarts
Group Size: individual, small groups
Materials: cup and quart measures, beans, rice, etc.

Procedure:

- Teacher instructs students to fill the cup with beans, then pour them into the quart measure. Students continue to do this, counting the number of cups used to fill the quart measure.
- Use the same procedure for above questions.
  Note: Students need time by themselves, filling and refilling containers of many sizes, when developing concept of capacity. It is recommended that several jars or bottles and materials like beans, rice, etc., be available to students for practice in comparing and predicting capacity of containers.

Suggested Monitoring Procedures

Possible Resources

District Resources

SMALL SCHOOLS PROJECT

Suggested Objective Placement 1-3

Student Learning Objective(s) A. The student knows that the terms "cup", "pint", "quart" and "gallon" refer to units of capacity measurement. B. The student is able to measure capacity using a cup, pint, quart, or gallon as the unit of measurement. C. The student knows that two cups equal one pint. D. The student knows that four cups or two pints equal one quart.

State Goal	1,7,9
District Goal	
Program Goal	

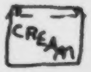
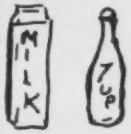
Related Area(s)

Suggested Activities: Grade(s) 1-3

Title: Cups, Pints, Quarts, Gallons
Group Size: individual or small group
Materials: paper, paste, magazines, label

Procedure:

- Students make a chart with 4 columns labeled:

Cup	Pint	Quart	Gallon
Coffee Tea	 Paint Thinner		Gasoline

- List things (words or pictures) that would usually be measured with the different measures.
  Note: Before introducing this activity, ask students to check at home, in stores and neighbors' homes and with parents, etc., about liquids and container sizes. On the following day, have students make the charts, using knowledge gained out of school, along with labels or pictures of products which they were able to secure. Display charts around the room.

Suggested Monitoring Procedures

Observe and record the success of the students as they do the activities.

Possible Resources

L-00360-P LAP
ESD 109 collection

District Resources

Suggested Activities: Grade(s) _______	Suggested Monitoring Procedures	Possible Resources
		District Resources

720

721

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student knows that the term "liter" refers to a metric unit of volume measurement. B. The student is able to measure capacity using the liter as the unit of measurement.

State Goal	1,6,7,9
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Liter Measure

Group Size: entire class in groups of 2, 3 or 4

Materials: Assemble the following material for each group:

- large pitchers of water
- liter measure marked in milliliters
- plastic funnel
- several empty containers such as:
  - paper drinking cup
  - coffee can
  - cottage cheese carton
  - salad dressing jar
  - soft drink can
  - catsup bottle
  - large bleach bottle
  - plastic mixing bowl
  - instant coffee jar
- record sheets
- plastic bucket or large pan

Procedure:

- Students take five of the containers and fill them with water. Then pour the water into the liter measure. Students record whether the container held less than a liter, more than a liter, or a liter.

	More	Less	One
Paper cup		X	

Suggested Monitoring Procedures

Mini-Test "Liter Measure"

Group Size: one student

Materials: liter pitcher, four containers of varying sizes labeled A, B, C and D, water supply, recording sheet

Procedure:

- Ask student to find the capcity in liters of all four containers and to record capacity of each container.

Possible Resources

Thyer, Dennis, Teaching Mathematics to Young Children, Holt, Rinehart and Winston, 1971, pp. 187-188

District Resources

Suggested Activities: Grade(s) 2-3

- Using five other containers, have students first estimate whether each container will hold less or more than a liter, or a liter exactly. Record on the record sheet. Students then check the estimates by following directions in the first paragraph.
- Using the plastic bucket or large pan and the liter measure, have students place a given number of liters of water in the large container, e.g., measure five liters of water into the bucket.

Title: Liter Measure
Group Size: entire class
Materials: 5 different containers (#10 can, dishpan, pail, large bowl, sink), one liter measure, water

Procedure:
- Copy the following table:

Container	Estimated Number of Liters	Actual No. of Liters
#10 can		
Dishpan		

- Record your liter estimates.
- Have five different students fill each container using the liter measure. Students record to the nearest liter the actual number of liters.

Suggested Monitoring Procedures

Teacher observes the student as the measurement is being done.

Possible Resources

Kids' Stuff Math

District Resources

SMALL SCHOOLS PROJECT

SUBJECT: **Mathematics**

SPECIFIC AREA: **Measurement: Weight**

	Page	Suggested Grade Placement	District Placement K	1	2	3	4
The student knows:							
. the term "kilogram" refers to a metric unit of weight.	367	2-3					
. the term "gram" refers to a metric unit of weight.	369	2-3					
. the term "pound" refers to a unit of weight.	371	2-3					
The student is able to:							
. weigh objects to the nearest kilogram.	367	2-3					
. weigh objects to the nearest gram.	369	2-3					
. weigh objects to the nearest pound.	371	2-3					
The student values:							

726

OPTIONAL GOALS AND ACTIVITIES

PHYSICAL EDUCATION	MUSIC	SOCIAL STUDIES
ART	LANGUAGE ARTS	MATH
SCIENCE	HEALTH	READING
CAREER EDUCATION	ENVIRONMENTAL EDUCATION	OTHER ______________

SMALL SCHOO[illegible] PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student knows the term "kilogram" refers to a metric unit of weight. B. The student is able to weigh objects in the nearest kilogram.

State Goal 1,6,7
District Goal
Program Goal

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Measuring Activities
Group Size: 10 students at a time
Materials: 1 metric bathroom scale (for entire group)
5 balance scales and metric weights
5 cans of soup, corn
5 tea bags
10 oranges
2 kg dried beans
5 cans of coffee
5 boxes of crackers
5 bars of soap
1 large box of laundry detergent
5 boxes of cereal
5 pennies
5 large books

Procedure:

- Teacher directs students to weigh each object and record the weight:
  Soup _____g
  Cereal box _____g
  15 beans_____g
  1 tea bag _____g.

729

Suggested Monitoring Procedures

Teacher observation of individual student weighing objects

In small groups, have the student demonstrate ability to weigh objects, e.g., marbles.

Have students weigh several objects, recording the weights on a record sheet. Teacher checks sheet for accuracy.

Mini-Test: "Nearest Kilogram"
Group Size: one student
Materials: empty 3 lb. coffee can, water supply, kilogram weights, simple balance

Procedure:

- Ask each student to fill the 3 lb. coffee can with water to determine its weight to the nearest kilogram.

Possible Resources

Laycock, Mary and Watson, Gene, The Fabric of Mathematics (A Resource Book for Teachers), Hayward, California: Activity Resource, 1971, pp. 140-142

Metric Bathroom Scale

District Resources

730

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

- Teacher directs students to estimate the weight of the following objects, then weigh them:

	Est.	Actual
Can of corn	______g	______g
Crackers	______g	______g
10 pennies	______g	______g
1 orange	______g	______g
Can of coffee	______g	______g
1 large book	______g	______g
1 large book	______kg	______kg
Student	______kg	______kg

- Teacher directs students to measure out the following portions, then check for accuracy:

  (a) 1 kg of oranges
  (b) 500 g of laundry soap
  (c) 250 g of dried beans

District Resources

SMALL SCHOOL PROJECT

Suggested Objective Placement 2-3

Student Learning Objective(s) A. The student knows the term "gram" refers to a metric unit of weight. B. The student is able to weigh to the nearest gram.

State Goal	1,6,7
District Goal	
Program Goal	

Related Area(s)

Suggested Activities: Grade(s) 2-3

Title: Grams
Group Size: entire class in groups of 2 or 3
Materials: Collect a set of the following for each group of 2 or 3 students:

- 1 metric scale (a balance scale with weights, a kitchen scale or a combination of these scales as available)
- a variety of items to weigh such as:
  - can of soup
  - a book
  - several coins
  - a ruler
  - bags of dried beans or pebbles, or paper clips
  - an orange
  - a pencil
  - a tablet
  - a ball of clay

Procedure:

- Teacher directs students to:
  - (a) Weigh 10 of the objects and record the weight in grams. Make a record of your observations.
  - (b) Take several objects not weighed before and:
    1. estimate their weight
    2. measure their weight
    3. make a record of the estimate and actual weight

Suggested Monitoring Procedures

Teacher observation of individual student weighing objects.

In small groups, have the student demonstrate ability to weigh objects, e.g., marbles.

Have students weigh several objects, recording the weights on a record sheet. Teacher checks sheet for accuracy.

Mini-Test: "Gram Measures"
Group Size: one student at a time
Materials: 10 crayons, 10 pencils, chalkboard eraser, 5 pencils, simple balance, gram weights, chart to complete

Procedure:

- Ask student to estimate the weight of each in grams and then to find weight of each.

	Guess	Actual Weight
10 crayons		
10 pennies		
chalkboard eraser		
5 pencils		

Possible Resources

Laycock, Mary and Watson, Gene, The Fabric of Mathematics (A Resource Book for Teachers), Hayward, California: Activity Resource, 1971, pp. 140-142

Centicubes

District Resources

Suggested Activities: Grade(s) 2-3

Suggested Monitoring Procedures

Possible Resources

Est.	Actual	
3 g	______ g	paper clip
______	______ g	pencil

(c) Using beans, coins, paper clips or something similar, students:

1. Select an amount equal to a given weight; then weigh to see how accurate the estimate was.

Example:

Find 500 g of paper clips: Actual wt. __________

- Centicubes: Centicubes are a versatile and useful metric tool for primary students. Each edge is 1 cm, each surface 1 cm^2; volume 1 cm^3; weight 1 gram. The weight is surprisingly accurate. They come in 10 attractive colors, are durable, non-toxic, etc.

Title: Gram Measurements
Group Size: small group
Materials: various objects less than 50 g, 50 centicubes for each student

Procedure:

- Teacher directs students to:
  - (a) Find 7 objects you estimate to be less than 50g
  - (b) Students complete the chart:

Object	Est. Wt.	Measured Wt.
giant can		
paper clip		
2 washers		

  - (c) Put the objects in order, lighest first.
  - (d) Try again with 7 other objects, Teacher asks: "Are your estimates improving?"

District Resources